

A
DETAILED PROJECT REPORT
ON
HANDMADE PAPER
MANUFACTURING & CONVERSION UNIT



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CONTENTS

–	
I. INTRODUCTION	2
II. MANAGEMENT APPRAISAL.....	Error! Bookmark not defined.
Part I - Manufacturing Unit.....	5
I (A). PROJECT DEFINITION, CONCEPT AND SCOPE	6
I (B). TECHNICAL FEASIBILITY.....	8
I (C)COMMERCIAL VIABILITY	13
I (D)FINANCIAL APPRAISAL.....	166
I (E)ECONOMIC VIABILITY.....	188
Part II - Conversion Unit.....	24
II (A) PROJECT DEFINATION CONCEPT AND SCOPE.....	25
II (B) TECHNICAL FEASIBILITY.....	26
II (C) COMMERCIAL VIABILITY.....	27
II (D) FINANCIAL VIABILITY.....	28
II (E) ECONOMIC VIABILITY	29
III CONCLUSION	34
IV ANNEXTURE	35

Introduction

The history of paper dates back to the history of human culture and civilization. The ancient Egyptians, Greeks and Romans used a different kind of paper called 'papyrus'. To-day's kind of paper was first developed and used by China and spread to other countries. Growth of human population, need for transfer of knowledge, education and information within the society at large were forcing factors for innovations and notable increase on the production of paper.

Modern paper making began in early 19th century in Europe. All most all paper is manufactured using trees as primary source of wood pulp. Paper manufacturing continues to be a concern in modern times from an environmental perspective due to its use of large number of trees, harsh chemicals, huge water consumption resulting in ecological imbalances, pollution and contamination risks.

Eco-friendly paper is a solution to solve all environmental related problems. Though some tools and equipment are used in making eco-friendly, paper it is still called traditionally as a handmade paper only all over the world. It is a paper that does not utilize wood for its manufacturing – is free from all chemicals and is dried using most eco-friendly means of energy – it is a bio-degradable product.

Handmade paper making in India begin in 3rd Century B.C. This paper making has been a traditional art which has been passed through generation by craftsmen known as 'Kagzis'. The name being derived from the word 'Kagaz' meaning paper. Through these are now almost extinct except in small pockets like Jaipur, the handmade paper making is fast developing in several parts of our country and now it gained a status of commercial venture and a sound business proposition. The demand for handmade paper and its product is fast growing in the domestic as well as international market.

NIRD&PR identified this project as one of the important activities that creates employment among unskilled and semi skilled people, provide regular source of income, develops entrepreneurship among youth, encourage recycling of waste, produce biodegradable products and above all helps to create an eco-friendly environment.

Eco-friendly Handmade paper making

A survey shows that for the manufacture of 1 ton of paper 277 Eucalyptus or 462 bamboo plants are required. On the other hand 100000 greeting cards on hand made paper can save 500 trees. The concern about disappearance of forests, coupled with renewed interest in quality of paper generated new study on the paper makers materials especially the pulp and fibers. According to KVIC experiences "Handmade paper product is a real treasure with full of creative, innovative and thought provoking ideas and the industry got an excellent future because of value addition and export oriented prospective".

Handmade paper has the advantage of being 100% wood free which makes it most eco-friendly form of paper. Handmade paper is excellent for writing as well as printing. It has greater tensile, bursting, tearing and double fold strength compared to conventional papers.

Handmade paper is eco-friendly, bio-degradable, recyclable, the best in quality as well as utility and above all availability at an affordable cost.

Demand for Handmade paper

The handmade paper industry in India offers considerable potential to meet the increasing demand for paper products in an environmentally sound way. People are moving to maximize the use of handmade and recycled paper to generate a reverse chain reaction. Undoubtedly the use of eco-friendly paper ushers in a self sustainable society.

Handmade paper is used for office stationary, writing pads, conference folders, computer printouts, drawing and documentation sheets, certificate and degree awards, for making fancy products and diaries, for making photo frames, paper bag and variety of other decorative and show case products.

The countries like Indonesia, Malaysia and Philippines have already emerged as “Hand made paper giants”. There has been phenomenal growth in the export market for Indian handmade paper and its products especially in developed countries like USA, German, Europe, Australia etc.

One estimate shows that in India only about 20% of waste paper is being currently recycled annually which is very low in comparison to 73% in German, 69% in Sweden, 60% in Japan, 49% in USA and 45% in Italy. ITC launched a program on paper collection called “wealth out of waste, WOW”. The location of major handmade paper industries in India are Rajasthan, New Delhi, Tamil Nadu, Pondicherry etc. Hyderabad is also home for several small and medium sized handmade paper industries. Sanganer near Jaipur in Rajasthan is the world’s largest centre of handmade paper.

Shri AMM Murugappa, Chettiar Research Centre, Chennai, Jabalpur Chamber of Commerce & Industry for EDP, Kalpana handmade paper Sanganer, Jaipur, M.R. Exports Vijayawada, (Pamarru Mandal) are well established training research and production centers in handmade paper making.

Raw materials used in Handmade paper making

A wide range of raw materials such as paddy and wheat straw, jute, rags, cotton rags, hosiery cuttings cotton linter, tailor cuttings, fibers (Jute /hump), bagasse, cotton stalks, grasses, waste paper etc., are used in making handmade paper. They are available abundantly and regularly from different sources. The proposed unit makes permanent arrangement for procuring raw materials in bulk from various suppliers.

Service Requirements and its availability for proposed manufacturing unit

Water
Power
Building shed
Drying shed
Labour /work force
Chemicals

The most common equipment / machines used for handmade paper making

Rag Chopper, beaters, Pulp Tanks, Calendar machine, Agitator, Hydraulic press, cylinder mould, Vat power drives machine, Iron box etc are major tools and equipments used.

All these machines and equipment are available within the country and can be easily procured by placing orders with suppliers.

Special Marketing strategies for handmade paper products

Demand for handmade paper and its products is fast growing everywhere. Due to increasing awareness among public on environmental protection, people preference for eco-friendly products has been increasing. These products have its own special customers. The elite and educated individuals as well as several organisations in public and private sector choose to go for handmade paper products and occasionally, they purchase in bulk also. The suppliers or manufacturers of these products have to make vide publicity and make readily available variety of products may it be paper bag, greeting card, show case items or any other. The models / varieties of handmade paper products are to be exhibited and demonstrated in public gatherings, exhibitions, office premises, high level meeting places etc. The heads of PSUs and private sector units need to be contacted as part of marketing strategy. District Collectors, high level bureaucrats like Secretaries, Directors, Commissioners, CEOs need to be approached for getting large scale orders for the supply of handmade paper products.

All State institutes of Rural Development (SIRDs) start using eco-friendly handmade products for their routine stationary items and replace all plastic and synthetic items like bags with handmade paper products. These products may be used as best example by our SIRDs to take forwards the campaign of Swatch Bharat, environmental care and protection and recycling of waste.

With such an aggressive marketing strategy the sales would increase to profitable level within a short time. The manufacturing and sales unit may explore opportunities for exports business also. The manufacturers engage continuously in product innovation and invention to capture business from variety of customers.

(A) PROJECT DEFINITION, CONCEPT AND SCOPE

A real fact in today's world is that one tone of mill made paper cost our earth 270 trees or 400 bamboo plants. Therefore, today there is a focus on usage of handmade papers.

This proposal deals with the Project for manufacturing Handmade Papers. These handmade papers may be converted into different items for daily use such as bags, files, folders etc. Now a days there is a good market for handmade paper since the products of handmade are eco friendly, free from destructive chemicals and non-Toxic. It's also an employment generative activity. It's one of the preferred industries since investment is comparatively lower than any such allied industrial units. At the same time this handmade unit has potential to generate good profits.. It needs around 4000 sq. feet land to construct a work shed and any one can run the unit with about 6 persons. Depending upon the handmade papers design and thickness and other features the sale value increases or decreases for products.

SWOT Analysis of the handmade paper manufacturing unit is as follows

- Strength – Eco friendly, nontoxic, bio degradable cellulose fiber contained product. Its uniqueness is its strength because of its texture, feel and color.
- Weakness- Price of handmade paper is comparatively high than normal mill papers. Linkage between supplier and manufacturer seems to be a problem too. Moreover many people avoid it due to problems in usage especially in rainy days.
- Opportunity – Handmade paper may be converted into different products from a well decorative hand bag to decorative gift folders. A particular section of people are the customer of these products and they value these products a lot.
- Threat – These are labor intensive units and in order to sustain them, continuous market demand should be there to meet the financial need of these units as well as the labors working in these units

It is one of the oldest methods of making paper. Generally, it was made by sifting pulp on to a screen and letting each individual sheet of paper dry. But it was time consuming and mainly used in Nepal, Japan, China and Thailand for centuries to produce exceptionally beautiful paper. Now, handmade paper is a delicate customized special product. Handmade papers are mainly used in handmade paper conversion units. These papers gets converted into gift cards, wrapping paper, photo albums, wedding invitation, collages and picture frames etc. Therefore, so much of emphasis is being given on handmade paper manufacturing units. To reiterate, some of the features of handmade paper are mentioned below:-

1. It has an elegant and exquisite surface for writing.
2. It has indestructibility and superb strength for performance.
3. It has unmatched texture for drawings by artists or engineers
4. It comes in colors of fancy varieties for decorative wraps.
5. It has high tensile bursting, tearing and double fold strength as compared to mill made paper.

I. (B) TECHNICAL FEASIBILITY

a. Location of the Project

This unit can be established at any rural, semi urban as well as urban location. Land area of about 4000 sq.ft, with water facility is good enough to run this industrial unit.

b. Human Resource

- 1 Supervisor
- 3 Male labor and
- 2 Female labor

c. Raw materials

<ul style="list-style-type: none">• Waste cotton rags• Old ropes• Waste paper• Waste cuttings• Hosiery & Tailor cuttings• vegetable matter (including leaves, tree moss, potatoes, flowers)• Bleaching powder, Diacol/wet & additive, Titanium Dioxide	<ul style="list-style-type: none">• Jeans waste cuttings• Jute bag waste or jute waste• Office record waste paper• Liquid Rosin Soap, Alum, Whitening Agents• Agro-waste fibers like Bagasse, Banana, Mulberry, Hemp & Remi• Other items such as grease, oil, cloth, galvanized iron sheets, adhesive, color etc.
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d. Utilities

- Power: The total requirement of the unit is 36 HP
- Water: The water requirement of the unit for the production of 80 Kgs per day i.e. 12000 liters.
- Effluent Treatment: The effluent discharged from handmade paper plant contains only very insignificant quantity of chemicals. The total chemicals used are lesser than 3% of the total weight. The waste water effluent will be treated before discharge to nearby agro forms or drainage

e. Technology and manufacturing process

i) Plant and Machinery

The standard equipment are available for handmade paper production. The important among them are:

- (a) Rag chopper- It is used for cutting the rag into fine pieces suitable for beating in beater machine. Beater Machine-The pulp from the pulper machine sent to beater machine for the formation of fine pulp which plays an important role for formation of board of good quality. Auto Vat - used for the forming of paper sheets in the traditional Indian manner. A measured quantity of diluted pulp is spread evenly on to a wire mould, which is clamped in between two wooden deckles in a water tub. The excess water in the pulp is drained mechanically by manual operation.
- (b) Hydraulic press -- presses the post of newly formed sheets to remove excess water
- (c) Calendaring machine-- It's a series of hard pressure rollers used to form or smoothen a sheet
- (d) Cutting machine-- Is used for waste cutting
- (e) Weighing balance-- For weighing or measuring weight of raw materials as well as other required items.

1. Manufacturing Process - The process of making handmade paper involves a series of steps that are briefly discussed below.
Sorting and dusting: the raw material that is to be used is manually sorted and foreign material like buttons; plastic, synthetic fibers etc. are removed. To remove dust and dirt the material is shaken vigorously.
2. **Rag Chopping:** The sorted and dusted material is chopped into pieces of equal size.
3. **Beating:** The raw material is mixed with water and harmless chemicals and beaten in a Hollander beater. This consists of a U-shaped trough, with a drum; on the outer side of this drum are iron blades that cut the raw material to make a pulp out of it.

There is a washing drum as well that cleans the pulp and drains the dirty water. The quality of the paper to be made determines the consistency of the pulp.

Sheets of handmade paper can be made in two ways.

4. **Dipping Method:** This method is normally used for fine or thin paper. The pulp is diluted with water and put into a masonry trough or vat. The lifting mould (a mesh on a wooden frame) is dipped into the trough, shaken evenly and lifted out with the pulp on it. The consistency of the pulp in the tank should be kept constant all the time.
5. **Lifting Method:** This method is used for all paper and especially for card paper. A fixed quantity of pulp is poured evenly onto a mould, which is then clamped between two wooden deckles (frames) and then dipped into a water tank. The mould is then lifted using a lever mechanism that allows the excess water to drain away.
6. **Couching:** Once the sheet is formed, the wet paper is transferred onto a cloth like muslin or felt sheet and a stack of interleaved sheets is made.
7. **Pressing:** A hydraulic press is used to remove the excess water from the sheets. Pressing reduces the thickness of the paper and the sheets become more compact. This process improves the physical properties of the paper and helps drying.
8. **Drying:** Even after the sheets have been pressed, they still contain about 50% to 65% of the moisture. The sheets are hung in the sunlight to dry. Solar driers can speed up the process and the space required for drying. Coloured papers are dried in the shade to prevent the sun from bleaching the color.
9. **Cleaning and Sizing:** Small particles of dirt and other foreign matter are removed manually with a sharp instrument. The cleaned sheets are coated with a layer of starch to improve the quality of the paper and prevent feathering. This process is called sizing. This can be done manually using a brush or by dipping the sheet into a vat containing sizing chemicals.
10. **Calendaring:** The sheets are then placed between metallic plates and passed through spring-loaded rollers in a calendaring machine. This makes the paper smooth and increases the gloss of the paper.
11. **Cutting:** The sheets are cut neatly according to the required size using a cutting machine.



Figure 3 Beater Machine



Figure 3 Calender Machine

f. Inspection and quality control

Handmade paper has potential to gain widespread acceptance. provided material is produced and delivered with a high level of consistency, quality and precision. Quality control aspects are more important for the handmade paper units than the rest of the paper industry. In recent years quality control procedures has evolved to some extent. As a part of quality control a unit should at least lay down specifications for purchase of raw materials, should inspect production procedure and should control pulp parameters. Acceptance procedures for pulps can only ensure whether the paper to be produced will be suitable for down line processes till the finishing stage or not. The unit will employ a trained supervisor to take care of quality checks

g. Schedule of Implementation

The building can be arranged within 3 months period. The machinery can be procured within 4 months period from the date orders are placed. The total project can be completed within 6 months period and production could commence could commence immediately thereafter.

I. (C) COMMERCIAL VIABILITY

Handmade paper industry produces paper such as drawing paper for artists, permanent document paper, dark colored card sheets, deckle edged stationery, exclusive greetings, and varieties of fancy decorative wraps, unique paper for carry bags, water mark paper certificates, filter papers and pads besides other cultural grades like covers, duplicating paper and tissue paper. These products have good demand in the domestic market and find usage in the stationery, greeting card, packaging industry and have tremendous unexplored potential in export markets. Superior Variety Handmade Paper like bond paper, Decorative Paper, Drawing Paper, Card sheets, mottled paper, moon rock paper, banana paper and other varieties can be produced. Different varieties of handmade paper can be used for interior decoration, corporate gifts, and office purpose. New attractive varieties of ecofriendly handmade paper have very good demand in India and abroad. On small quantity a special quality handmade paper can be produced and converted in to value added products to earn good profit.

Pure cellulosic (or raw) materials to be pulped, mechanically rather than chemically pulping methods. In fact, the existing handmade paper industry relies absolutely on secondary resources. There is no theoretical limit to the size of handmade paper units, though in India they are often limited in practice to a particular production capacity. The table below shows comparative facts for a normal paper unit and handmade paper unit.

Sl No.	Handmade Paper Unit	Normal Integrated Paper Unit
1	Consumption of resources is lowest in handmade paper units	Consumption of resource is more in these units
2	Water consumption per ton 150 cubic meter	Water consumption per ton 250 cubic meter
3	Electricity consumption comparatively less and chemical consumption relatively less	Electricity consumption , chemical consumption is more
4	Pollution is quite low	Pollution is more

- Multiple Dimensional Aspects: -Viability of this unit can be analyzed from Environmental Aspects, Social aspect and economic aspect. Different aspects has been discussed below:-
 - Environmental aspect - The manufactured products from this industry is eco friendly in nature. It gets recycled easily. People are concerned over cutting of trees keeping that in mind these handmade papers are better options.
Further, the use of diverse materials depends on the development of environment-friendly processes. One area of research will be the usage of biotechnology for lignin removal using organism such as white rot fungi.
 - Social aspect - This industry has the potential to generate employment for 5-10 members per unit, depending on the production capacity this number may increase further. These products are having high value. These products are in demand everywhere in the world due to its classic look. Further, waste cellulose materials and paper waste emanating from different industries is productively used. This will require the creation of partnerships for integrating recycling technology with social objectives in an economically viable manner.

- Economic aspect- This industry has the potential to generate employment for 5-10 members per unit depending on the production capacity this number may increase further. These products are having high value. These products are in demand everywhere in the world due to its classic look and peoples choice for eco friendly products.

Handmade paper production requires close controls on thickness and weight, both of which have traditionally depended on exceptional operator skills. Technology development will need to integrate methods for rapid skill development as a means of internal quality control. This is an opportunity for economic development too.

I. (D) FINANCIAL APPRAISAL

i. Basis And Presumption Of The Project

- Number of working days = 300
- Number of Shifts = 1
- Plant produces = 80 Kgs output per day
- Number of kg produced in an year = 24000 Kgs (100% plant utilization)
- Price of per kg = Rs 200

ii. Cost of the Project

Finance is the most important part of any project. We would look into various financial aspect surround the Handmade Paper Manufacturing unit in this chapter.

S No	Particulars	Quantity	Amount (Rs.)
	Capital Expenditure		
1	Land 4000 sq. ft.		250000.00
2	Work Shed		
	A. 1500 sq. ft x 200 (For Production Shed)		300000.00
	B. 1500 sq. ft x 26 (For Drying Shed)		40000.00
3	Required machineries / Equipment		
	A. Rag Chopper	1	61192.00
	B. Hollander Beater	1	265000.00
	C. Auto Vat	4	160000.00
	D. Hydraulic press	1	248136.00
	E. Calendaring machine	1	223136.00
	F. Cutting machine	1	261192.00
	G. Weighing balance	1	6000.00
4	Bore well	1	85000.00
	Total		1899656.00

iii. Means of Financing

Loan can be processed under different programs of government of India,

- Prime Minister's Employment Generation Program (PMEGP) under Khadi and Village Industries Commission (KVIC)
- National Rural Livelihood Mission under State Rural Livelihood Mission (NRLM)
- ASPIRE under Micro, Small & Medium enterprises
- MUDRA- Pradhan Mantri Micro Units Development and Refinance Agency Limited (MUDRA)
- Startup- Start Up India
- SIDBI - Small Industries Development Bank Of India
- Different Bank's startup fund- e.g. 'Bank Of India and Innovations'
- And other allied programs in government

I. (E) ECONOMIC VIABILITY

a) Working Capital (Per Year)

S No	Particulars	Amount (Rs.)
1	Raw Materials (Cotton hosiery rags, Cotton jeans waste cutting, jute bag waste, office record waste paper)	1800000.00
2	Adhesives (@ 3 per kg)	90000.00
3	Color (@0.88 per kg)	26625.00
4	Maintenance	50000.00
5	Salaries	
	1 Supervisor @ 20000 * 12	240000.00
6	Wages	
	2 Male Skilled Labor 8000 @ month *12	192000.00
	2 Female Skilled labor @ 8000 @ month * 12	192000.00
	4 Unskilled labour (2 Male & 2 Female)	204000.00
7	Electricity @ 1 unit per 1 kg production (1 unit= 8 Rs)	192000.00
8	Miscellaneous (grease, oil, cloth, Galvanized Iron sheets etc.)	80000.00
	Total	3066625.00

b) Cost of production per unit with 70% plant capacity utilization

Sr. No	Particulars	Amount
1	Unit produced (Kg)	16800.00
2	Unit fixed Cost (Rs)	90.59
3	Unit Variable Cost (Rs.)	67.33
	Total (Rs.)	157.92

c) Income Projection

- Production capacity of plant = 80 kg per day

Sr. No	Particulars	1st Year 70% utilization (Rs.)	2nd Year 80% utilization (Rs.)	3rd Year 100% utilization (Rs.)	4th Year 100% utilization (Rs.)	5th Year 100% utilization (Rs.)
A	Revenue					
1	Sales	3360000.00	3840000.00	4800000.00	4800000.00	4800000.00
	Total revenue	3360000.00	3840000.00	4800000.00	4800000.00	4800000.00
B	Expenses					
1	Raw materials	1260000.00	1440000.00	1800000.00	1800000.00	1800000.00
2	Colors	15975.00	18637.50	26625.00	26625.00	26625.00
3	Adhesives	54000.00	63000.00	90000.00	90000.00	90000.00
4	Electricity expenses	192000.00	192000.00	192000.00	192000.00	192000.00
5	Salary expenses	240000.00	240000.00	240000.00	240000.00	240000.00
6	Wages expenses	588000.00	588000.00	588000.00	588000.00	588000.00
7	Depreciation on equipment and building @ 10%	173065.00	173065.00	173065.00	173065.00	173065.00
8	Maintenance	50000.00	50000.00	50000.00	50000.00	50000.00
9	Miscellaneous	80000.00	80000.00	80000.00	80000.00	80000.00
10	Cost of production	1521975.00	1713637.50	2108625.00	2108625.00	2108625.00
	Total cost	2653040.00	2844702.50	3239690.00	3239690.00	3239690.00
11 (A-C)	EBIT	706960.00	995297.50	1560310.00	1560310.00	1560310.00
12	Interest @ 12%	221053.00	182058.00	138117.00	88603.00	32809.00
13	Tax @ 5%	168000.00	192000.00	240000.00	240000.00	240000.00
14 [12-(12+13)]	EAT	317907.00	621239.50	1182193.00	1231707.00	1287501.00

Note: - EBIT- Earnings Before Interest and Taxes,EAT- Earnings After Taxes

d) Loan Calculation

- Loan Amount Rs.1980000.00, Interest Rate= 12%,
- Loan repayment calculation

Period	Installment (Rs.)	Interest (Rs.)	Net payment (Rs.)	Balance (Rs.)
1st Year	307475.00	221053.00	528528.00	1672525.00
2nd Year	346470.00	182058.00	528528.00	1326055.00
3rd Year	390411.00	138117.00	528528.00	935644.00
4th Year	439925.00	88603.00	528528.00	495719.00
5th Year	495719.00	32809.00	528528.00	0.00

e) Profitability table (@ 70% plant capacity utilization)

Total unit produced per year =16800.00 Kg

Sr. No	Particulars	Amount
1	Annual Gross Profit ((Rs.))	706960.00
2	% of profit on sales	21.04%
3	Annual fixed cost (Rs.) i.e. (67.33 X 16800)	1131065.00
4	Annual Variable cost (Rs.) i.e. (90.59 X 16800)	1521975.00
5	Annual sales(Rs.) i.e. (200 X 16800)	3360000.00
6	Break Even Point (Units per Kg)	10338

*BEP= Fixed cost/ (Selling price per unit – Variable cost per unit)= 1131065/ (200-90.59)

f) Cash flow statement

Discounted at 12% interest rate

Year	Cash Outflow ((Rs.))	Cash Inflow (Rs.)	Cash Flow (Rs.)	PV of cash Outflow (Rs.)	PV of cash Inflow (Rs.)
1	2653040.00	3360000.00	706960.00	2368785.71	3000000.00
2	2844702.50	3840000.00	995297.50	2539912.95	3428571.43
3	3239690.00	4800000.00	1560310.00	2892580.36	4285714.29
4	3239690.00	4800000.00	1560310.00	2892580.36	4285714.29
5	3239690.00	4800000.00	1560310.00	2892580.36	4285714.29
Total				13586439.74	19285714.30

Note: PV- Present value

Benefit Cost (BC) ratio=1.41, Internal rate of return (IRR) =32.61 %, hence the project is feasible

g) Debt Service Coverage Ratio(DSCR) Calculation

Sr. No	Particulars	1st Year 70% utilization (Rs.)	2nd Year 80% utilization (Rs.)	3rd Year 100% utilization (Rs.)	4th Year 100% utilization (Rs.)	5th Year 100% utilization (Rs.)
A	COVERAGE					
1	Net Profit	317907.00	621240.00	1182193.00	1231707.00	1287501.00
2	Depreciation	173065.00	173065.00	173065.00	173065.00	173065.00
3	Int. on Loan	221053.00	182058.00	138117.00	88603.00	32809.00
	TOTAL(Rs.)	712025.00	976363.00	1493375.00	1493375.00	1493375.00

Sr. No	Particulars	1st Year 70% utilization (Rs.)	2nd Year 80% utilization (Rs.)	3rd Year 100% utilization (Rs.)	4th Year 100% utilization (Rs.)	5th Year 100% utilization (Rs.)
B	REPAYMENT					
1	Int. on Loan	221053.00	182053.00	138117.00	88603.00	32809.00
2	Repay. Amounts	307475.00	347475.00	390411.00	439925.00	495719.00
	TOTAL (Rs.)	528528.00	528528.00	528528.00	528528.00	528528.00
	DSCR=A/B	1.35	1.85	2.83	2.83	2.83

Average (DSCR) = 2.33, which is well above the ideal DSCR value i.e. 2 and it clearly indicates that the venture is profitable.

In the above table for production of 24000kg of output 30000 kg raw material requirement has been considered. In the next table Project cost has been considered as Rs1899656, as a matter of fact 30% margin and 70% loan i.e. Rs 1329000 has been considered. As per the norms of RBI committee, generally the working capital requirements have to be 25% of projected sales. Out of it 20% is provided by bank and 5% margin by the borrower. So 20% of projected sales, Rs 3360000 i.e. Rs 672000 is the loan. Thus, adding term loan of Rs 1329000 and Cash Credit loan of Rs 672000. Total loan amount has been rounded off to Rs 1980000.

From the above tables and justifications it clearly establishes the fact that the project is economically viable. Judging by all counts the handmade paper conversion unit seems to a viable business and this has the potential to generate livelihood for few families and can also act as an environment friendly initiative for the world.

h) Sensitivity Analysis –

This technique has been used to determine how different values of an independent variable can impact a particular dependent variable under a given set of assumptions. All figures mentioned above are only indicative and may vary from place to place.

1. There is a possibility where the entire investment cost can be reduced as per the options given below:-

- a) If work shed can be built on own land
- b) If a work shed already exists as readymade or a shed on rent is taken
- c) Work of two unskilled laborers can be done by two skilled manpower if situation demands.

Other than the above two fixed cost factors, variable cost may be altered too. In fact there are factors which will force the investor to alter the cost.

2. The variable factors are as follows:-

- a) Cost of raw materials

Based on above mentioned conditions

- i. Profitability will increase
- ii. Interest on Capital Expenditure will also reduce
- iii. BEP will improve

A detailed calculation has been worked out in Annexure.

- i) Handmade papers are manufactured in different forms which are given below. Paper differs in thickness. Thickness depends on content of cotton fiber etc.

<ul style="list-style-type: none"> ➤ Drawing paper for art work ➤ Permanent document paper ➤ Dark coloured card sheets ➤ Deckle edged stationery ➤ Exclusive greetings ➤ Unique carry bags 	<ul style="list-style-type: none"> ➤ Water mark paper for certificates ➤ Filter paper and pads ➤ Insulation paper ➤ File covers ➤ Duplicating paper ➤ Tissue paper
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j) List of some of the Suppliers of Raw Material

For cotton waste, fabric waste:

- 1) Banyan, hosiery fabrics may be procured from Tirupur.
- 2) All fabric manufacturers in Erode, Salem, Karur, Kumarapalayam
- 3) Cotton and jeans fabrics may be procured from Bangalore

k) Usage of manufactured Product

Handmade Paper manufacturing units has multiple usages. Price of handmade paper varies based on thickness of the paper. These papers are sent to conversion unit from the manufacturing units for diverse usage. Activities related to conversion unit will be discussed in the second part of this proposal.

PART II- CONVERSION UNIT



Fig3. Handmade paper conversion

II. (A) PROJECT DEFINATION CONCEPT AND SCOPE

Handmade paper conversion unit can be established with nominal investment. This activity as said earlier can be adopted by a family or collective of individuals or by a Self Help Group. People working in this conversion unit require some skill. There is some unskilled labour work too. Conversion Unit can be a good option for individual worker too. The person needs to be skilled in one or two particular sphere of work among various types of conversion materials. In an unorganized manner this activity can be taken up in small scale. The worker need to purchase the raw materials required for this purpose. Rs. 3000 is sufficient to start this business. Customized byproducts will be produced from handmade paper. But to run this business in a very organized manner a dedicated space, team of workers, capital is needed. Total business feasibility has been discussed in this section of this proposal.



Fig. 4 Handmade paper conversion unit

II. (B) TECHNICAL FEASIBILITY

Handmade Paper is converted to different items using rivets, threads, adhesive, dyes and pins. Each has its own application in the whole process in a handmade paper conversion unit.

Raw material required in these units is as follows:-

1. Paper sheets (hard board)
2. Rivets
3. Threads
4. Fevicol
5. Colors
6. Pins etc.

In order to use the above mentioned raw materials for converting handmade paper few human resources are required. They are as follows:-

- Manager
- Helper
- Skilled worker and
- Unskilled workers

Machines required for an organized industrial unit are as follows:-

- Cutting Machine
- Punching Machine
- Screen Printing Machine
- Filing machine
- Perforation machine etc.

II. (C) COMMERCIAL VIABILITY

Small handmade paper conversion unit has a captive market for products such as:-

- New attractive file covers and file boards in different colors
- Paper for demi official letters heads
- Attractive envelopes in different colors.
- Railway tickets , post cards , money order form , wrapper , ration card paper
- Products such as corporate gifts , desktop items , multipurpose box , stationary box etc. are well accepted in the market
- It has good market in India and abroad

The price of handmade paper is slightly higher than normal mill made paper but still these papers are in demand for a particular section of the society. At this juncture DGS&D, government departments procure handmade paper as well as handmade paper materials from KVIC. Annually off take is nearly 2000MT. Even Tamil Nadu state government every year purchases nearly 25 MT of handmade paper as stationary materials. Some leading dealers in handmade paper industry purchase nearly 30 MT of handmade paper every year.

II. (D) FINANCIAL APPRAISAL

Finance is the most important part of any project. We would look into various financial aspect surround the Handmade Paper conversion unit in this chapter.

A. Cost of the Project:

○ Land	Own
○ Cost of construction of Work Shed	Rs.1,00,000.00
○ Cost of Equipment (Screen printing Machines Die embossing, Machine Pinning Machine, Cutting, Machine, Scales Etc.)	Rs.1,00,000.00
○ Working Capital requirement	Rs. 4,00,000.00
○ Total	Rs.6,00,000.00

B. Means of Financing:

● Out of total project cost (i.e., 100%)	Rs.6,00,000.00
● Applicants/Promotors Contribution (i.e., 25%)	Rs.1,50,000.00
● Bank Loan required (i.e., 75%)	Rs.4,50,000.00

Further funds may be availed from different government programs mentioned below.-

- Prime Minister's Employment Generation Program (PMEGP) under Khadi and Village Industries Commission (KVIC)
- National Rural Livelihood Mission under State Rural Livelihood Mission
- ASPIRE under Micro, Small & Medium enterprises
- Pradhan Mantri Mudra (Micro Units Development & Refinance Agency Ltd.) Yojana
- And other allied programs in government

II. (E) ECONOMIC VIABILITY

C. Project outlay:

Sl. No.	Particulars	Project Cost	Promoters Margin	Bank Loan
1**	Cost of construction of Work Shed	1,00,000.00	25000.00	75,000.00
2	Cost of Machinery & Equipment (as per quotation)	1,00,000.00	25000.00	75,000.00
3	For Working Capital (Raw material, salaries & wages and other expenses)	4,00,000.00	1,00,000.00	3,00,000.00
	Total (Rs.)	6,00,000.00	1,50,000.00	4,50,000.00

***Note: - This may be avoided if sufficient space is available for installing basic machines required for a handmade paper conversion unit*

D. Profitability Projections:

Projected income and expenditure for one month:

1. Revenue from Sales	Rs. 1,92,500.00
2.	
a. Raw material	Rs. 1,07,625.00
b. Salaries / Wages	Rs. 30,000.00
c. Other expenditure (Power, Transport etc.)	Rs. 15,000.00
d. Depreciation	Rs. 5,000.00
e. Interest	Rs. 5,160.00
f. Income Tax	Rs. 3,000.00
g. Repayment of loan	Rs. 3,000.00
	Rs. 1,73,785.00
3. Net Profit (1-2)	Rs. 18,715.00

Therefore, as per the projection profit in these units will be nearly eighteen thousand seven hundred and fifteen rupees only per month. This profit can be enhanced depending on some variable factors such as skill of a personnel, raw material cost etc.

E. Financial Viability of the Project

The financial calculations are based on the below mentioned raw materials which are required per day.

Production of handmade paper bag	
Paper Sheets 100 Nos. (each sheet costs Rs 25)	Rs.2500.00
Rivets 800 Nos.	Rs.400.00
Thread	Rs. 160.00
Fevicol	Rs. 240.00
Power Charges	Rs.200.00
Total	Rs. 3500.00
Three thousand and five hundred rupees only	

Production of handmade office files	
Paper Sheets 100 Nos. (each sheet costs Rs 25)	Rs.625.00
Rivets 400 Nos.	Rs.200.00
Thread	Rs. 80.00
Fevicol	Rs. 100.00
Power Charges	Rs.100.00
Total	Rs. 1105.00
One thousand , one hundred and five rupees only	

Let us assume that the unit will run for 25 days in a month and at least four workers will work for 8 hours in a day in a work shed. Keeping that in mind, nearly 300 bags can be prepared in a day. This is because at least 3 bags can be produced from a single sheet. Similarly, 50 files can be produced per day because 2 files can be prepared from a single sheet. Hence, in one month there will be production of 7500 bags and 1250 files. Sales price of the produced bags or files are having an average price of Rs 22 only. One can have a sale of Rs. 192500.00 in a month from an organized unit.

F. Profitability Projected Statement for 5 years

Sl No.	Particulars	1st year (Rs.)	2nd year (Rs.)	3rd year (Rs.)	4th year (Rs.)	5th year (Rs.)
1	Sales Revenue	80%	90%	100%	100%	100%
2	By Sales	1848000.00	2079000.00	2310000.00	2310000.00	2310000.00
i	Raw Materials/ stocks	1033200.00	1162350.00	1291500.00	1291500.00	1291500.00
ii	Salaries & wages	240000.00	300000.00	360000.00	360000.00	360000.00
iii	Other expenses	144000.00	162000.00	180000.00	180000.00	180000.00
iv	Depreciation on building (5 %)	0.00	0.00	0.00	0.00	0.00
v	Depreciation on machinery and equipment (10 %)	60000.00	60000.00	60000.00	60000.00	60000.00
vi	Interest on term loan	61920.00	56700.00	52650.00	48600.00	44550.00
3	Total	1539120.00	1741050.00	1944150.00	1940100.00	1936050.00
4	Gross Profit (2-3)	308880.00	337950.00	365850.00	369900.00	373950.00
5	Provision for taxes	11776.00	17580.00	21500.00	21500.00	21500.00
6	Profit after taxes	297104.00	320370.00	344350.00	348400.00	352450.00
7	Repayment obligations	30000.00	30000.00	30000.00	30000.00	30000.00
8	Net Profit (6-7)	267104.00	290370.00	314350.00	318400.00	322450.00

The above statement clearly reveals that the unit will earn adequate profits even after fulfilling provision for taxes and repayment of loans.

G. Projected Cash flow statement

Cash Flow Statement

Particulars	1st year	2nd year	3rd year	4th year	5th year
	Rs	Rs	Rs	Rs	Rs
Bank loan	450000.00	0.00	0.00	0.00	0.00
Party Contribution	150000.00	0.00	0.00	0.00	0.00
Gross receipts	1848000.00	2079000.00	2310000.00	2310000.00	2310000.00
Total	2448000.00	2079000.00	2310000.00	2310000.00	2310000.00
Cash Outflow	0.00	0.00	0.00	0.00	0.00
Fixed Assets & Working Capital	600000.00	0.00	0.00	0.00	0.00
Cost of product as per abstract	1033300.00	1162000.00	1291000.00	1291000.00	1291000.00
Expenditure	384000.00	462000.00	540000.00	540000.00	540000.00
Interest- TL & WC (0.69+0.72)	62000.00	57000.00	53000.00	49000.00	45000.00
Bank instalment	30000.00	30000.00	30000.00	30000.00	30000.00
Family drawing	120000.00	120000.00	120000.00	120000.00	120000.00
I. tax	12000.00	18000.00	22000.00	22000.00	22000.00
Total Outflow	2241300.00	1849000.00	2056000.00	2052000.00	2048000.00
Opening balance	0.00	207000.00	437000.00	691000.00	949000.00
Surplus	207000.00	230000.00	254000.00	258000.00	262000.00
Closing balance	207000.00	437000.00	691000.00	949000.00	1211000.00

H. Debt Service Coverage ratio

Sl No.	Particulars	1st year	2nd year	3rd year	4th year	5th year
		Rs.	Rs.	Rs.	Rs.	Rs.
A	<i>Coverage</i>					
1	Net Profit	460800.00	454650.00	478500.00	478500.00	478500.00
2	Depreciation	60000.00	60000.00	60000.00	60000.00	60000.00
3	Int. on Term Loan	61920.00	56700.00	52650.00	48600.00	44550.00
	Total	582720.00	571350.00	591150.00	587100.00	583050.00
B	Repayments					
1	Int. on Term loan	61920.00	56700.00	52650.00	48600.00	44550.00
2	Repayment on Term loan	30000.00	30000.00	30000.00	30000.00	30000.00
	Total	91920.00	86700.00	82650.00	78600.00	74550.00
C	DSC (A/B)	6.34	6.59	7.15	7.47	7.82
	Average DSCR	7.07				

Average DSCR to the above unit is calculated as 7.07 which is more than the ideal ratio i.e. 2.00, from which it is clearly evident that the firm has good repayment capacity and the promoter can easily repay the loan installments regularly without any interruption.

Working capital requirement: (Operation cycle Method)

1. No of days to acquire raw material and days of storage : 20 days
2. No of days for process : 6 days
3. No of days storage of produce : 6 days
4. No of days for collection : 8 days
5. Total days of one operation cycle: 40 days

Total No of one operation cycle in year = $300 \text{ days} / 40 = 7.5 \text{ cycles}$

- Working capital required in a year = Rs. 29,70,000.00
- Working capital required per cycle Rs $29,70,000 / 7.5 = \text{Rs} 3,96,000.00$
- Promoter's contribution = Rs 96,000.00
- Working Capital Required = Rs 3,00,000.00
- Term Loan = Rs 1,50,000.00

III CONCLUSION

From the above tables and justifications it clearly reveals that the project is economically viable in all aspects and the handmade paper conversion unit seems to a viable business and this has the potential to generate employment for many families and can also act as an environment friendly initiative for the world.

I. Address of Machinery and Equipment Suppliers

- 1) Sri. V. Arrumugam Industries No. 2, Velayudaeswaran Koil Street, Rangavilas Thottam, Pondicherry-605003, India, Ph No. 08048012422 ; email id-arumugam@gmail.com, website-<https://www.indiamart.com/sriv-arrumugam-industries/hand-made-paper-machineries.html>.
- 2) S. L. Paper Machines LLP , Pushpam Complex, Opposite Seema Hall, 100 Feet Road, Satellite, Ahmedabad - 380015, Gujarat, India , Ph-8079450382 , email id , website <http://www.papermachineries.com>
- 3) Further, one may visit www.indiamart.com or <http://www.papermachineries.com> for more alternatives.

J. Training

Rural Technology Park under NIRD & PR is one of the competent authorities with in India which imparts training to entrepreneurs as well as interested individuals in handmade paper manufacturing as well as handmade paper conversion enterprise. Interested entrepreneurs as well as individuals can contact RTP under NIRD & PR for handholding as well as comprehensive training on handmade paper enterprise.

K. Disclaimer

Subject to availability of raw materials, transportation and other variable factors, estimates can differ from one geographic location to another geographic location. Rates may be modified as per the original rate of a particular location to get the actual estimate.

L. Summary

Looking at tremendous potential of this handmade manufacturing activity as well as conversion unit this proposal helps in establishing many new handmade paper units in the coming days. This is an attempt to bring eco friendly paper in the market as well as to generate employment opportunities for many families.

IV ANNEXURE

- i) Project Cost has been kept as it has been described above i.e. Rs 1899656
- ii) As described above few factors such as cost of raw materials, number of labors and rate of interest may vary depending on geographic location as well as other condition.

In this section such factors have been considered to establish the project. So when

- Cost of raw materials = Rs 35 per Kg (It differs from place to place)
- Rate of interest = 8 % per annum

a. Working Capital per year

S No	Particulars	Requirement	Requirement	Amount (Rs.)
1	Raw Materials (Cotton hosiery rags, Cotton jeans waste cutting, jute bag waste, office record waste paper)	35	30000	1050000.00
2	Adhesives (@ 3 per kg)	3	30000	90000.00
3	Color (@0.88 per kg)	0.88	30000	26625.00
4	Maintenance	1	50000	50000.00
5	Salaries			
	1 Supervisor @ 20000 * 12	12	20000	240000.00
	Wages			
6	2 Male Skilled Labor 8000 @ month *12	24	8000	192000.00
	2 Female Skilled labor @ 8000 @ month * 12	24	8000	192000.00
	4 Unskilled labor (2 Male & 2 Female)	0	4250	0.00
7	Electricity @ 1 unit per 1 kg production (1 unit= 8 Rs)	8	24000	192000.00
8	Miscellaneous (grease, oil, cloth, Galvanized Iron sheets etc.)	1	80000	80000.00
	Total			2112625.00

b. Cost of production per unit with 70 % capacity utilization

Particulars	Amount
Unit produced (Kg)	16800.00
Unit fixed Cost (Rs)	59.34
Unit Variable Cost (Rs.)	55.18
Total (Rs.)	114.53

c. Income Projection

Sr. No	Particulars	1st Year 70% utilization (Rs.)	2nd Year 80% utilization (Rs.)	3rd Year 100% utilization (Rs.)	4th Year 100% utilization (Rs.)	5th Year 100% utilization (Rs.)
A	Revenue					
1	Sales	3360000.00	3840000.00	4800000.00	4800000.00	4800000.00
	Total revenue	3360000.00	3840000.00	4800000.00	4800000.00	4800000.00
B	Expenses					
1	Raw materials	735000.00	840000.00	1050000.00	1050000.00	1050000.00
2	Colors	15975.00	18637.50	26625.00	26625.00	26625.00
3	Adhesives	54000.00	63000.00	90000.00	90000.00	90000.00
4	Electricity expenses	192000.00	192000.00	192000.00	192000.00	192000.00
5	Salary expenses	240000.00	240000.00	240000.00	240000.00	240000.00
6	Wages expenses	384000.00	384000.00	384000.00	384000.00	384000.00
7	Depreciation on equipment and building @ 10%	173065.00	173065.00	173065.00	173065.00	173065.00
8	Maintenance	50000.00	50000.00	50000.00	50000.00	50000.00
9	Miscellaneous	80000.00	80000.00	80000.00	80000.00	80000.00
10	Cost of production	996975.00	1113637.50	1358625.00	1358625.00	1358625.00
	Total cost	1924040.00	2040702.50	2285690.00	2285690.00	2285690.00
11	EBIT	1435960.00	1799297.50	2514310.00	2514310.00	2514310.00
12	Interest @ 8%	146275.72	118430.11	88273.31	55613.52	20243.00
13	Tax @ 5%	168000.00	192000.00	240000.00	240000.00	240000.00
14	EAT	1121684.28	1488867.39	2186036.69	2218696.48	2254067.00

d. Loan repayment calculation

Loan = Rs. 1980000, Interest rate = 8 % p.a., Time Period= 5 years

Year	Installment	Interest	Net Payment	Balance
1st	335491.4	146275.72	481767.12	1644508.6
2nd	363337.01	118430.11	481767.12	1281171.57
3rd	393493.81	88273.31	481767.12	887677.76
4th	426153.6	55613.52	481767.12	461524.15
5th	461524.12	20243.00	481767.12	0.00

g. Profitability table (@ 70 % plant capacity utilization)

Total unit produced per year = 16800 Kg

Sr. No	Particulars	Amount
1	Annual Gross Profit ((Rs.)	1435960.00
2	% of profit on sales	42.74
3	Annual fixed cost (Rs.) i.e. (59.34X 16800)	996975.00
4	Annual Variable cost (Rs.) i.e. (55.18 X 16800)	927065.00
5	Annual sales(Rs.) i.e. (200 X 16800)	3360000.00
6	Break Even Point (Units per Kg)	6591.00

h. Cash Flow Statement

Year	Cash Outflow ((Rs.))	Cash Inflow (Rs.)	Cash Flow (Rs.)	PV of cash Outflow (Rs.)	PV of cash Inflow (Rs.)
1	1924040.00	3360000.00	1435960.00	1717892.86	3000000.00
2	2040702.50	3840000.00	1799297.50	1822055.80	3428571.43
3	2285690.00	4800000.00	2514310.00	2040794.64	4285714.29
4	2285690.00	4800000.00	2514310.00	2040794.64	4285714.29
5	2285690.00	4800000.00	2514310.00	2040794.64	4285714.29
Total				9662332.58	19285714.30

- Internal Rate of Return , IRR = 89.59%
- Hence project is feasible.

i. DSCR calculation

Sr. No	Particulars	1st Year 70% utilization (Rs.)	2nd Year 80% utilization (Rs.)	3rd Year 100% utilization (Rs.)	4th Year 100% utilization (Rs.)	5th Year 100% utilization (Rs.)
A	COVERAGE					
1	Net Profit	1121684.00	1488867.00	2186037.00	2218696.00	2254067.00
2	Depreciation	173065.00	173065.00	173065.00	173065.00	173065.00
3	Int. on Loan	146276.00	118430.00	88273.30	55613.50	20243.00
	TOTAL (Rs.)	1441025.00	1780363.00	2447375.00	2447375.00	2447375.00

Sr. No	Particulars	1st Year 70% utilization (Rs.)	2nd Year 80% utilization (Rs.)	3rd Year 100% utilization (Rs.)	4th Year 100% utilization (Rs.)	5th Year 100% utilization (Rs.)
B	REPAYMENT					
1	Int. on Loan	146275.72	118430.11	88273.31	55613.52	20243.00
2	Repay. Amounts	335491.4	363337.01	393493.81	426153.6	461524.12
	TOTAL (Rs.)	481767.12	481767.12	481767.12	481767.12	481767.12
	DSCR=A/B	2.99	3.70	5.08	5.08	5.08

Average DSCR =4.39, so this is profitable.