

## INVESTMENT OPPORTUNITIES

# Manufacturing of Hand Made Paper

### 1. INTRODUCTION

This report will contribute by way to prevent the environment from pollution, and manufactures have been motivated to initiate this industry and promote its product to the export market.

The total investment of the project is Rs. 1,551,605 /- and the Cost of the Machinery and Equipment is Rs. 450,000/-.

### 2. MARKET

There is a demand in normal market for the following items based on hand made paper.

- a) File Covers
- b) Thick Papers for packing
- c) Thick Papers for Curios

There is a great market for file covers and there is a vast demand for wrapping / packing papers and invitation and greetings, specially during festive seasons as most people prefer to buy invitations which handmade by hand made papers.

#### Supply:

The companies, which produce handmade paper in Sri Lanka, are as follows.

- 1) Mr. J.A. Nihal Rohana  
Nirmal Paper Products  
30/1, Welgoda
- 2) Mr. Gamini Alexander  
Paper Craft Design Centre  
364/2a, Jinasena Mw.  
Mahara, Kadawatha
- 3) Iresha Dharmasena  
Roapa Handmade Paper (pvt) Ltd.  
P.O. Box 16, Kandana.
- 4) Mrs. Ira Basnayake  
"Kadasi"  
Rohini, Bolletha  
Ganemulla.
- 5) Mr. Manisha Samarasinghe  
Charka (Pvt) Ltd.,  
387/7, Araliya Grdens  
Nawala Road  
Rajagiriya.

### 3. TECHNICAL ANALYSIS

#### 3.1 Description of Products

G.S.M 50- 200 paper (32"x24")

#### 3.2 Raw Material usage – main raw

material used paper scraps (waste paper). The other components used are Resins, Alum and Sodium Carbonate.

#### 3.3 Description of Process

##### Raw Material Treatment

Waste paper has to be stored into colored and white portions. The staples, pins and other foreign materials are removed. It is then torn into pieces about 2 square inches.

##### Soaking

The waste paper (pieces) is allowed to soak in water for a period of 24 hrs. prior to beating to enable the separation of fibers in the material.

##### Beating

The soaked material is next transferred to the Hollander type beater. Here the material is suspended in about 10 times its weight of water and is disintegrated. Disintegration takes about 1 ½ hours.

##### Sizing

The disintegration material (pulp) is transferred to the pulp tank where a small amount of resin sizing is added. A small amount of alum is also added, after sizing the pulp stock is ready for paper lifting.

##### Paper Lifting

Lifting of sheet from prepared stock is done on paper vats. Some skill is required, on the part of the vatman, to make papers of uniform thickness. Even inexperienced workers after about a week's practice would be able to do this properly.

##### Pressing

Sheets are interleaved with either cotton or woolen cloth and the pile thus formed is pressed under a heavy screw press exerting a pressure of not less than 60 lbs per square inch.

##### Sheet Drying

This operation involves separation of the sheets of paper from the cloth piece and their transfer to

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racks made of wood ( or length of PVC piping ) with semi-circular taps.

### Tub sizing

One by one the sheets are dipped into a tub containing a dilute solution of gelatin. This is followed by a light pressing operation to remove excess solution after which they are placed on racks for drying.

### Calendaring

The dry sheets having uneven surface need calendaring for a better surface finish. The sheets are interrelated with Zinc Sheets and passed between the two rolls of a calendar machine. The calendar rolls are loaded by means of a spring arrangement. Several passes between the rolls could impart the sheets a better surface finish.

### 3.4 Description of Machinery and Equipment

1. Hollander beater ( for pulp making) - 01 No.
2. Calendaring machine - 01 No.
3. Screw Press ( 30'x20' ) - 01 No.
4. Board Cutter - 01 No.
5. Paper Vat (including deckle and mould) (30"x20") - 01 No.
6. Trough (to be constructed with cement /brick) - 01 No.
7. Soaking Tank (to be constructed) - 01 No.
8. Pulp Tank (-do-) - 01 No.
9. Press Boards - 02 No.
10. Couching Table - 02 No.
11. Wooden Vat for sizing - 01 No.
12. Drying Stands - 02 No.
13. miscellaneous items such as GI brackets , cotton felts, plastic mugs, weighing balance and vessels for preparation of chemicals etc.

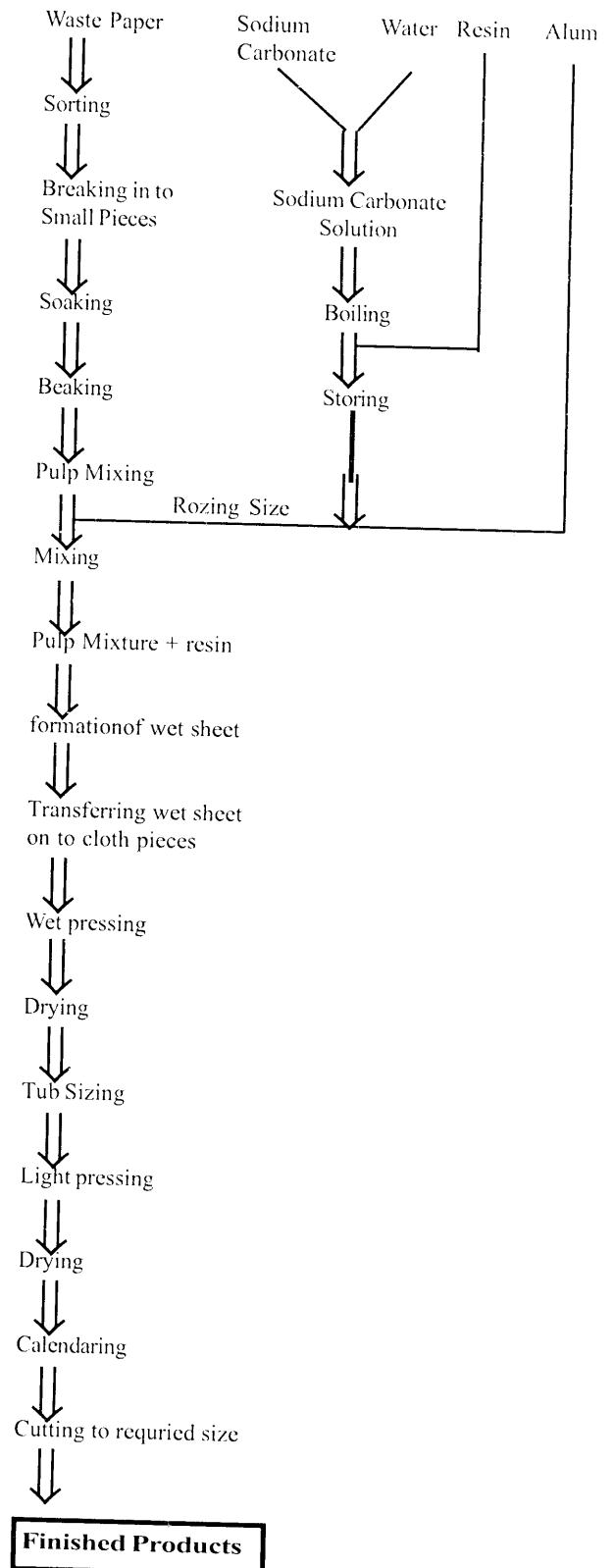
### 3.5 Hand made Paper Production Process

Basically there is a large difference between a paper mill and a hand made paper unit in chemical use in the production process. The use of chemicals in the case of handmade paper is in a very small percentage compared to the use of chemicals in a paper mill.

The hand made paper production process is mainly a physical process, which involves pulp beating, and forming during which only limited quantity of chemicals such as Sodium Hydroxide, Alum , Resin etc. are added. Therefore, there are hardly any toxic chemicals contained in the discharged water. The drained water mainly contains tiny fibers and some sizing material sediments. The discharged water is collected in sedimentation

tank and could be recycled in the production process.

### 3.6 Process Flow Diagram for Manufacture of Handmade Paper



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### 3.7 Utilities

#### 3.7.1 Electricity

The unit has to be provided with 3-phase electricity supply. The estimated cost is Rs. 40,000/-

#### 3.7.2 Water

The requirement of water is estimate about 1000 lt. per day.

### 3.8 Man Power requirement

#### 3.8.1 Direct Employment

The manpower requirement of the project is given below.

Job Category	Initial Requirement
Manger	01
Supervisor	01
Paper lifter	02
Coachers	02
Beater man	01
Calendar man	01
Unskilled laborer	01
Clerk	02

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The project will provide employment for 10 persons.

### 3.9 Waste Products and Disposal

1. A central sewerage system will be provided. A garbage collection and disposal system will be commissioned.
2. Noise and Vibration  
There will be unbearable noise at all (less than 40 db)

### 3.10 Environmental Clearance

To be obtained in due course from the Central Environmental Authority or Local Government Authority.

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