The Green Initiative

Under CSR programs of Airports Authority of India



Operation and Management of the Paper Recycling and Stationary Unit

(2012-2014)

By:

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PROJECT TITLE: "OPERATION AND MANGEMENT OF PAPER RECYCLING & STATIONARY UNIT"(2012-14) UNDER CSR INITIATIVE".

INTRODUCTION:

The Sustainable Livelihood Generation is an initiative to address the problem of spiraling poverty as well as environmental degradation simultaneously. The approach focuses on improving local people's well being and at the same time ensuring the conservation of the environment. A sustainable livelihood is concerned with both environmental influences on human life and human influences on the environment. On the one hand, the surroundings of a community should not harm its members and should provide for all their necessities of life. On the other, local communities and its people should be caretakers and not destroyers of the planet and its ecosystems. The Sustainable Livelihood framework places people, particularly underprivileged youth and poor people, at the centre of a web of inter-related influences that affect how these people create a livelihood for themselves and their house- holds. The approach identifies the main constraints and opportunities faced by these people. To achieve this, the approach focuses on two main areas that are also interlinked, Sustainable Natural Resources Management which involves conservation of resources, and Income Generation which involves developing and promoting small scale and environment friendly micro- enterprises including **waste paper recycling**.

The sustainable livelihood generation is concerned with local aspects of environmental sustainability and community well being.

Goals of the project:

To improve the environment by **recycling wastepaper** using a well proven **recycling plant** to produce useful products. To provide the poor with essential information, skills and awareness through sustainable livelihood and income generation programs to deliver projects in a manner that takes into account the importance of Environment conservation and sustainable management of natural resources. To directly involve local community groups in the project delivery cycle, including planning, implementation and monitoring & evaluation phases, in order to ensure the local ownership and sustainability of the project To enhance the effective participation in the areas of income generation and environmental conservation specially for under privileged youth/person to build and operate sustainable micro-enterprises such as **waste paper recycling unit.**

Paper is such a commodity with which we are very closely related in our daily life. Its use in communication and information, storage and transfer, science and technology, industry and education is

very well established. Per capita consumption of any country speaks for itself, its standard of living, literacy, and advancement in science and technology etc. with increase in industrialization, growth at literacy etc the per capita consumption of paper is growing up day- to- day.

Although it seems to be strange in the highly mechanical and computerised world but it is true that the most of the premium priced Watermark paper for educational Degree/ certificate paper, Corporate stationery paper and other high grade papers are in highly demand. The up graded technology has potential to generate sustainable employment with high margin as well as eco-friendly products to cater the current need of the advance national and international requirements

The equipments are involved in the paper recycling process is also very flexible and efficient in operation compared to that of conventional mill technology, that different varieties of paper according to that specific requirements of the client can be produced by the same WPR unit. Another advantage is the ability to use all sorts of waste materials like Waste paper, Waste cotton, Waste jute, carton boxes and cellulosic agricultural residue. The technology provides wider scope for setting up such recycling facility within institutions/ offices with small investment to suit CSR best program in the rural areas/semi urban area even in urban area and offers sustainable livelihoods.

Why use recycled papers?

Recycled paper has the advantage of being 100% wood free which makes it the most eco-friendly form of paper around. It is also 100% recycled. Handcrafted recycled paper is excellent for writing as well as printing. It has greater tensile, bursting, tearing and double-fold strength compared to conventional paper. Apart from all this it looks great, recycled paper is fashionable, it's up market, its classy! **Our papers can be decorated with flower petals, jute, wool, grass, straw etc**. Handcrafted paper seems to be the perfect thing to have come around in terms of environment friendliness. There are no chemicals used in the manufacture of our recycled paper. The paper is natural dried, so no energy wastage. No trees are cut to make such paper, the pulp used to make the paper is derived from Cotton Rags, and office waste paper and this makes it **100% eco-friendly and 100% natural. So recycled paper cuts down on pollution, its saves trees (and wildlife) thus contributing to a much healthier environment.**

Hand crafted paper is eco-efficient in the sense that neither prime forest produce is used nor any of the production process adversely affect the ecosystem. Neither polluted waste is not generated nor is any obnoxious substance released into the environment**.**

The popular concepts of waste reduction, reuse and recycle, often referred to as **"3R",** are particularly applicable in the context of production and consumption. It calls for an overall reduction in resources and energy used, increase in the ratio of recyclable materials and further reusing of raw materials and manufacturing wastes. Source reduction is generally perceived as being the highest rung on this ladder with the greatest potential for avoid in energy and raw material consumption as well as waste production. Waste materials generated during the production process can be reused or recycled both on-site (either in the plant or on the plant property) and off-site. **"Reuse"** means reusing a waste. Material directly, either for its original purpose or in a new role, without any major modification to the material before it is reused. Waste materials that are **"recycled**" require some form of significant physical, chemical or biological processing.

The '3R' ideas can be applied to the entire lifecycles of products and services – from design and extraction of raw materials to transport, manufacture, use, dismantling/reuse and disposal. At the production stage, the target stakeholder of businesses should look at '**3R'** oriented designs for resource-saving, long-life; reuse; recycling; and labeling of materials used. Orienting the consumption/use stage of the life cycle a product can be focused on national and local authorities to take the lead in purchasing environmentally friendly products and services. The collection/recycling stage is critical, asking of consumers to properly discharge the products they use, or participate in product buyback programmes; and of businesses to promote product recycling. At the final stage of disposal, businesses and municipalities have the responsibility to ensure that waste products are properly collected, processed and disposed.

The success of a **'3R'** initiative will largely depend on the right mix of policies and programmes implemented at the local level. Much of this will also depend on develop in integrated framework bringing together the above points with other issues, including(a) Investment policies and practices, such as greener procurement, subsidies and eco taxes, etc.; (b) Production policies and practices, such as integrated product policy, lifecycle assessment, extended producer responsibility, precautionary principle, polluter pays principle, eco-efficiency/ clean production, health and safety standards etc.; (c)Distribution policies and practices, such as right to know, advertising reform, eco labeling, packaging, pricing, transportation etc.; and (d) Consumption policies and practices, such as consumer values, norms and behavior, and awareness and environmental education. This paper is an attempt to review the waste reduction, reuse and recycle initiatives.

Main Steps of Office Paper Recycling:

1. MAKE A COMMITMENT TO RECYCLE

Top level management must support the recycling program.

2. APPOINT A RECYCLING COORDINATOR

A responsible and enthusiastic recycling coordinator is crucial to success. The time needed by thecoordinator is usually minimal and occurs primarily at the beginning of the program. Once operational,the program will be largely self-sustaining.

3. CARRY OUT A WASTE PAPER AUDIT

Knowing what is in your waste stream is essential in designing a recycling program. An audit will helpyou determine the composition of your waste stream, including the type, value and amount of wastepaper generated by your organization.

The most effective method of auditing your waste paper stream is to manually sort it over a specified period of time. Our company's/Institutions procurement records can also help you determine what paper you might generate. Finally, estimate your recyclable paper generation at 0.5 lbs. to 1.0 lbs. per employee per day.

4. DECIDE WHAT TYPES OF PAPER TO COLLECT

After evaluating the types of paper in your waste stream and finding out what kinds will be accepted by brokers or local recycling programs, determine the types of paper you want to collect. Focus on the higher value papers and those which make up the bulk of your waste paper stream.

5. ESTABLISH AN EFFICIENT COLLECTION SYSTEM

Prior to initiating your new recycling program, set up a formal collection system. Your existing trash collection system should provide the foundation for your recycling program. Always involve custodial personnel in the design of your collection system as they will be responsible for its implementation .Provide employees with a recycling container for their paper and a waste basket for non-recyclable materials. You may also choose to place recycling containers in areas where paper is generated such as near computer printers or copying machines.

You will need storage containers sized to hold the amount of paper materials you collect and located where they are easily accessible by your broker or hauler.

6. **EDUCATATION & SENSTIZATION OF EMPLOYEES-**

Employee education, sensitization and cooperation are essential for a successful recycling program. Plan on starting your educational campaign a week or so before the program kick-off. The purpose of this campaign is to prepare your employees for participation in the recycling program.

Explain the goals and methods of the program to employees prior to implementation. Develop brief orientation sessions for all employees. Distribute a simple, concise information sheet on your recycling program. Create incentives for your employees to recycle. Remember to always make it clear that the program has the support of senior management.

7. **KICK OFF YOUR RECYCLING PROGRAM**

This is the simplest step in implementing your program -- just pick a date, have a celebration and start recycling.

8. **MAINTAIN RECYCLING PROGRAM**

Maintenance and continued promotion are essential to ensure a lasting, successful recycling program. Issue memos, newsletter articles and announcements on a regular basis. Monitor central container locations and prepare follow-up educational materials if you discover a contamination problem. Maintain clear, concise signs in all locations. Include office paper recycling training for all new employees. Keep a record of what and how much office paper you are recycling to use to evaluate your program and provide feedback to employees. Have your recycling coordinator spend a few hours each month keeping the program going smoothly.

RECYCLING PARTNERSHIPS-

There is a large, unexplored wealth of waste cellulose materials and paper waste emanating from different offices/PSUs university and colleges /industries/corporate. Although systems exist for the recovery and recycling of major wastes, higher value addition can be achieved by internal recycling in the corporate /PSU /industries generating the waste.

This will require the creation of sustainable partnerships of N.G.O. having expertise in the paper recycling field for integrating recycling technology with social objectivesin an economically viable manner. Such partnerships need to be more researched, and their wide-scale acceptance amongst existing PSUs and industries promoted.

Society for Integrated Sustainable Development is not profit organization dedicated to sustainable development has taken commitment and challenge in the month of May - 2012 and marched with belief and ambitions to improve the quality and quantity of the products and decided to scale up the operation and management of paper recycling project by **Airports Authority of India** to meet the mandate of **Corporate social responsibility (CSR**). And also been able to evolved new thoughts and idea to bring

multiplier effects in the line of Value addition, "waste to wealth" environmental conservation and livelihoods generations program.

PAPER RECYLING FACTS-

Recycling a single ton of paper can save as many as 17 trees - as well as 7,000 gallons of water, 2 barrels of oil and 4,100 kilowatt-hours of electricity which go in production of the same? (That's enough energy to power a single American home for a period of six months.) This and other such recycling facts highlight the need of resorting to paper recycling very well. Given below are more of interesting facts about paper recycling which will shed light on its importance.

- **The 17 trees used to produce one ton of paper can absorb 250 tons of carbon dioxide from the atmosphere.**
- **Recycled paper causes 73 percent less pollution and uses 60 percent less energy as compared to paper produced from scratch using raw material.**
- **The importance of recycling paper can be attributed to the fact that it can reduce air pollution associated with paper production by 75 percent and water pollution by 30 percent.**
- **Around 40 percent of the wasted paper is used for landfills and thus, recycling every single ton of paper saves 3.3 cubic yards of landfill space.**
- **In a single office, 1lb of paper waste per employee is produced every year - of which 77 percent is scrap paper which can be recycled.**
- **Even though the use of computer has increased by a significant extent, around 115 billion sheets of paper are used to get computer printouts every year.**

Waste paper Recycling -A Sustainable Micro-enterprise because it is–

- **Energy conserving**
- **Pollution free and eco-friendly**
- **Converts waste into wealth by recycling/re-crafting**
- **Long life, low investment and labour intensive**
- **Personalised products**
- **Countless personalised varieties for corporate stationary**
- **Scores of fancy and textured varieties for cover paper.**

- **High return**
- **Decreasing carbon foot print**
- **Sustainable CSR program.**

Potential of theprogram-

The sincere effortson research & development has yielded goodoutput in terms of minimal investment and efficient equipments with highreturn which inspires the investor to adopt this sustainable technology and provide a scope for generation of sustainablelivelihoods and conservation of environment as well . There are plenty of embeddedeco-friendly features to produce special papers and products for technical / commercial applications. The technology also offers to redesign the system of value addition of waste materials / residue through recycling and advance manufacturing techniques. It creates a golden opportunity for us to become environmental partners in the process of sustainable development.

Unit capacity-60-70 tonnes/annum

Paper and paper products-

Paper-

- Bond paper/letter heads
- Calendar paper
- Coaster paper
- Envelopes paper
- Visiting Card sheets,
- Carry bags paper,
- Tag file paper
- File and folder sheets etc.

Product mix-

- Greeting cards/invitation cards
- Visiting cards/Thank you cards
- Carry bags/office files
- File/Folders
- Envelopes and letterheads
- Letter pads/certificate paper
- Other products like pen holder, Message cube boxes etc.
- Wall and table top calendars

Environmental benefits-

The manufacturing of recycled paper /hand crafted paper and paper products utilises waste materials and avoid pressure on forest and thus helps in maintaining healthy environment and decreasing carbon foot print. The unit produces no air /water pollutants as it relies simply on the mechanical process of waste recycling, pulping, sheet formation, natural drying and finishing etc.

Employment potential-

The technology has potential to provide sustainable employment to people through simple production processes and paper product crafting .The unit produces 250-300 kg of finished paper every day. It employs directly –18-20 people on regular basis. The total investment for setting up such a unit is 35-40 lacs excluding the land &building or station charges. Each person earns an average annual income of Rs 1.0 to 1.20 lacs.

The Recycling process:

The main raw material used for manufacturing is:

- Paper waste from school /colleges/institutions and offices

- Cotton waste from garment industries and tailor shops

Initial steps involve tearing, shredding and chopping of waste, which is then fed into a beater (pulping m/c) for pulping and treatment of the pulp as per paper to be produced (viz sizing,).The beater comprises of a milled steel trough (MS) and a beater roll, which is fitted with sharp stationery blades. The pulp is then transferred into agitator and from agitator to the cylinder mould machine though pulp pump to form sheets of wet papers in various grammage on – mould. These wet sheets are forwarded to drying section for natural drying in the open.. The cleaned sheets are the placed between two sheets of GI made to pass through calendaring rolls, a process in which the sheets are polished and smoothened. The polished sheets are then cut into required size with the help of cutting m/c. Finally; products are to be crafted as per design and need.

Details of manufacturing process –

Sorting and Shredding -

Rag/waste paper should be sorted thoroughly for removal of foreign matters. These are then cut into small pieces of 1.25"x1.25" by using special blades or rag Shredder. The agricultural residues and other cellulose material are cut into small and uniform pieces by a grass cutter. Sorted and cut materials are then dusted through dusting screen containing 4 to 6 no wire mesh.

Beating (Pulping)-

This process is carried out in the Hollander Beater. Fill the trough with required quantity of potable water. Take the beater roll down and start feeding the material gradually till the whole charge is added and then roll it further down for effective fibrillation. If washing is to done take 0.5 to 1% of liquid soap mixes it in the bucket of water and put it in the beater. After allowing sufficient time for washing beater roll further more down to take wet beating action. After wet beating desired ingredients are mixed with pulp and discharged in to pulp tank.

Paper Sheet formation-

From the storage tank, /agitator tank pulp should be taken to cylinder mould machine through pulp line driven with pulp pump, which form sheets of wet papers in various grammage on mould and transfer the paper sheet through blanket felts to pin cut roll in desired size and take out side from pin cut roll.

Drying- (sheets are put in an open area)-

Shift wet paper sheets by hand trolley into the open area for natural drying. Separated sheets are then hung with the support of drying clips for natural drying in bunches of 2- 3 depending on the thickness of the paper.

Calendaring- (smoothening the sheets suitable for efficient writing and printing)-

The dried sheets are then placed alternatively under GI plates to form a post and the post is then passed to and fro in between calendar rolls for obtaining desired smoothness**.**

Cutting, packing fabrication and despatch-

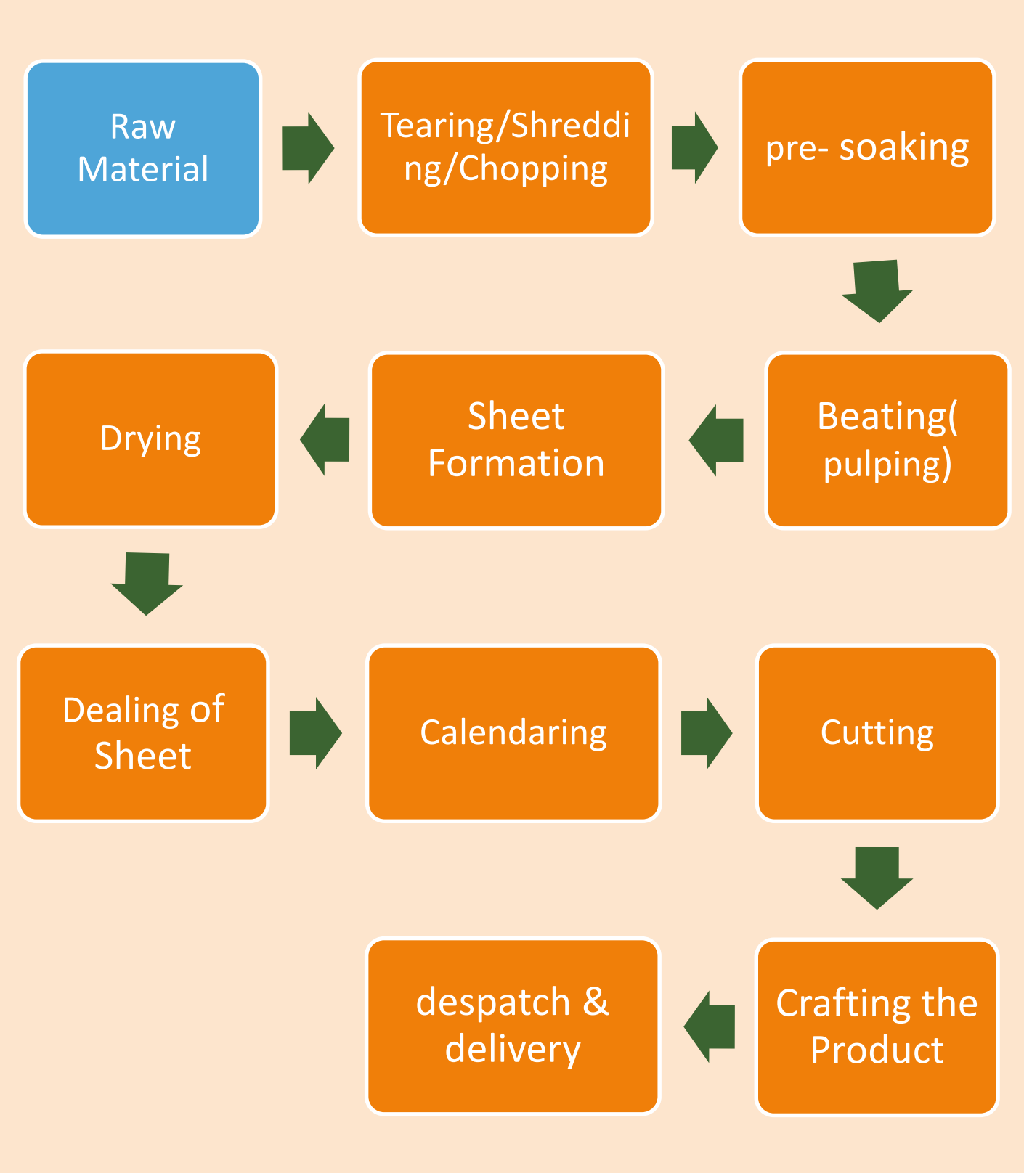
After calendaring, sheets are carefully sorted and then cut to the required size with the help of cutting m/c. The cut sheets are either then packed in reams or re-crafted the products. Products are crafted as per need and design.

The equipments used for these processes are tabulated below:

The technical details of equipments are engaged in recycling -

MACHINES	Specifications	No	HORSE POWER	RPM	PHASE
Rag shredder (60 Kg/hr)	Cap-60kg/hr	1	5.0	1440	3
Hollander Beater (18”x24”)	50kg/batch	2	15.0	950	3
Pulp pumps 3’x3’	3”x3”	3	5.0	1440	3
Agitators 7’x8’	7’x8’	2	5.0	1440	3
Cylinder mould machine Paper Sheet size- (34"X29") and 41”x29”	42”/56”		5.0	960	3
Head box	-	1	Manual	-	-
Back water pump 3”x4”		1	3.0	1440	3
Water recycling pump 1.5”	1.5”	1	3.0	2800	3
Calendaring Machine	14”x42”		10.0 HP	1440	3
Semi automatic Cutting Machine	32”		3.0+2.0	1440	3
Auxiliary /Conversion Tools(hammers, punch sticks , oilet fitters, scissors and scales etc.		1	Manual	N/A	N/A
File creasing machine		1	manual	-	-
Stapler machine		1	Mechanised	-	-
File punching machine		1	Manual	-	-

PRODUCTION PROCESS FLOWCHART



The process of making hand crafted recycling paper in India is unique as it utilizes waste material as raw material (waste paper ,cotton waste , waste jute and agro waste) and uses negligible amounts of ingredients whose toxic effect if, any is also eliminated by using plenty of water at every stage. Thepaper is so produced besides being beautiful is eco-friendly by nature.

The hand crafted recycled paper can be manufacture in varying thickness denoted in GSM. The paper sheets are used for crafting value added products like exotic stationary, gift items, Greeting, Visiting cards, wedding cards, and carry bags in various sizes. It also is possible to produce for special application such as certificate paper for educational degree /certificates etc. With having a strict quality control mechanism and good USP system .this technology has lot of potential for growth both in domestic as well in the international level.

In addition to the above points, in recent years more and more emphasis has been laid on production of high grade recycled paper, thus providing an additional and strong reason for the development and replication of the hand crafted paper recycling technology in India.

Man power Requirements- 18 20 nos

Ingredient requirements for production

- Sizing agent-Wax -1500
- Gawargum
- Misc items depending on the specificity and quality of the finished product

Raw material requirements for production-

- Office Waste paper/ packaging waste
- Waste cotton/ cotton rags
- School paper Waste
- Paper packaging waste

Items required for products fabrications & screen printing

- Cobra clip
- Oilets
- Cotton Doris
- Fevicol/adhesive
- Arrarotelai
- Various Inksand other items like Film, Nitro, Hydro, Reducer etcrequired for screen printing

THE MAIN MACHINE FUNCTIONS

S.NO	Production Activity	Machine Engaged
1.	Material Shredding	Shredder/ Rag chopper
2.	Beating (pulping)	Hollander Beaters
3.	Agitating the pulp	Agitating the pulp Agitators
4.	(Sheet formation)	Cylinder mould machine
5.	Paper Drying-sun drying	No machine required
6.	Calendaring (smoothening the paper sheets)	Calendaring machine
7.	Cutting- shaping the Sheets	Semi-automatic cutting machine
8.	Screen printing	Screen printing machine (Nano)
9.	Misc Crafting of the products	Hand Tools

Accessories -

AXILAARY ITEMS	Material	PURPOSE
Woolen felts	Woolen	Cylinder mould Machine
Heavy duty Drying Paper clips	Plastic and spring steel	Drying of paper
Couching table MS	MS	Keeping paper pile on it
Trolleys	MS	Loading and unloading the paper pile
Couching boards wooden	Wooden	Production
Buckets	plastic	Production
Mugs	plastic	Production
Waste paper Soaking drums	Plastic	Paper soaking
GI Sheets (22- gauge)	GI	Polishing of Paper

Paper Dimensions -

Standard paper size	In cm
Foolscap	43X34.5
Demy	57X45.5
Medium	45.5X58.5
Crown	38X59
Regal	59X63.5
Imperial	56X76
Double Imperial	69X102
Eagle	71X109

Paper type	Grammage(GSM)
Bond paper/Writing paper	90-100
Letter head paper	100
D.O letter head paper	100
Slip pad paper	100
Grey board file	1100-1200
Carry bag paper	200-220-300
Card sheets/visiting card /invitation cards	220-300-350
File folder sheets	300-350-400
File sheets	550-600
Coaster paper	650-700
Cover paper	200-300
Envelopes paper	90-130
Gift wrap paper	100-110
Wall Calendar paper	170-230
Desktop Calendar paper	200-220

Ream-500 sheets

Expression for calculating the ream weight of paper:

$$\text{Ream weight in kg} = \frac{\text{GSM of paper X size of paper}}{3100}$$

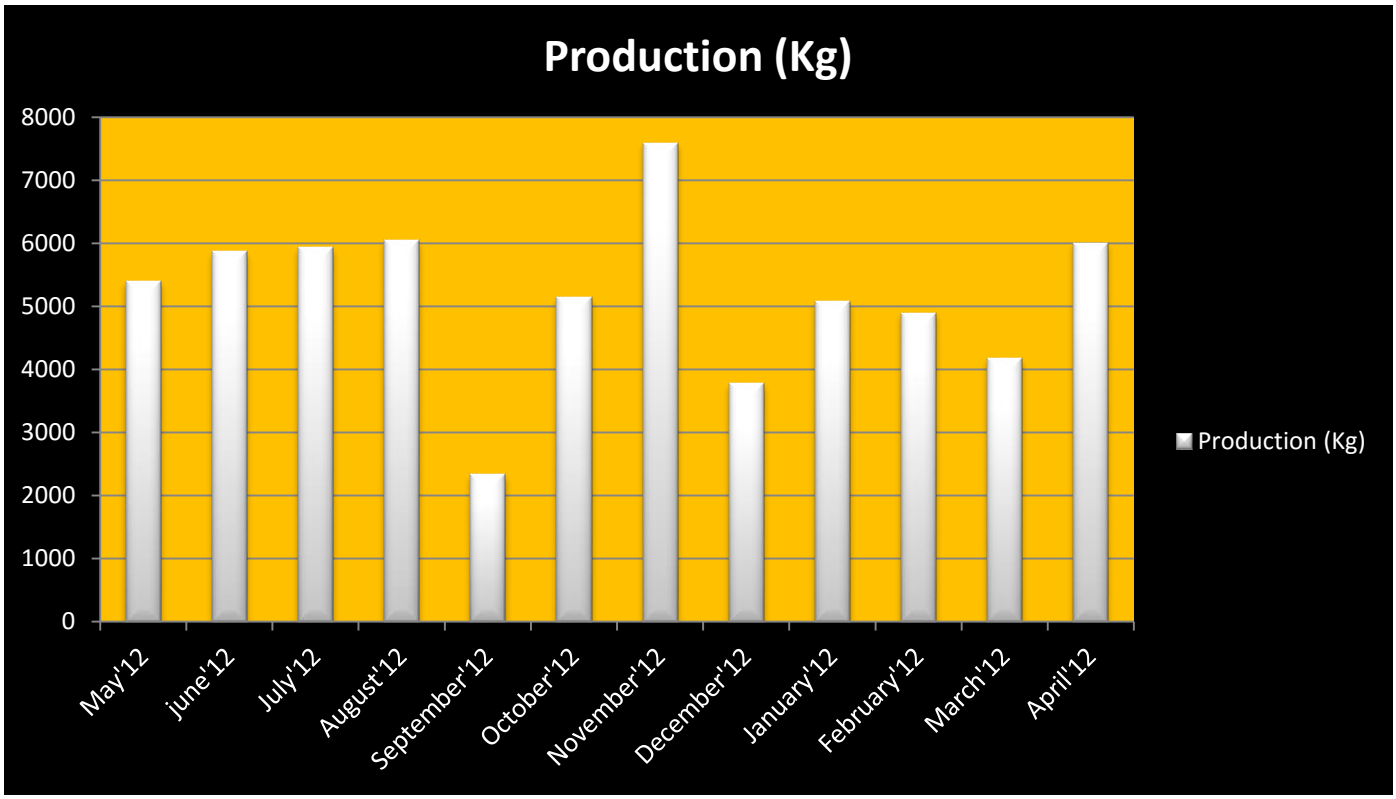
Annual production, job created and environmental saving -2012-13

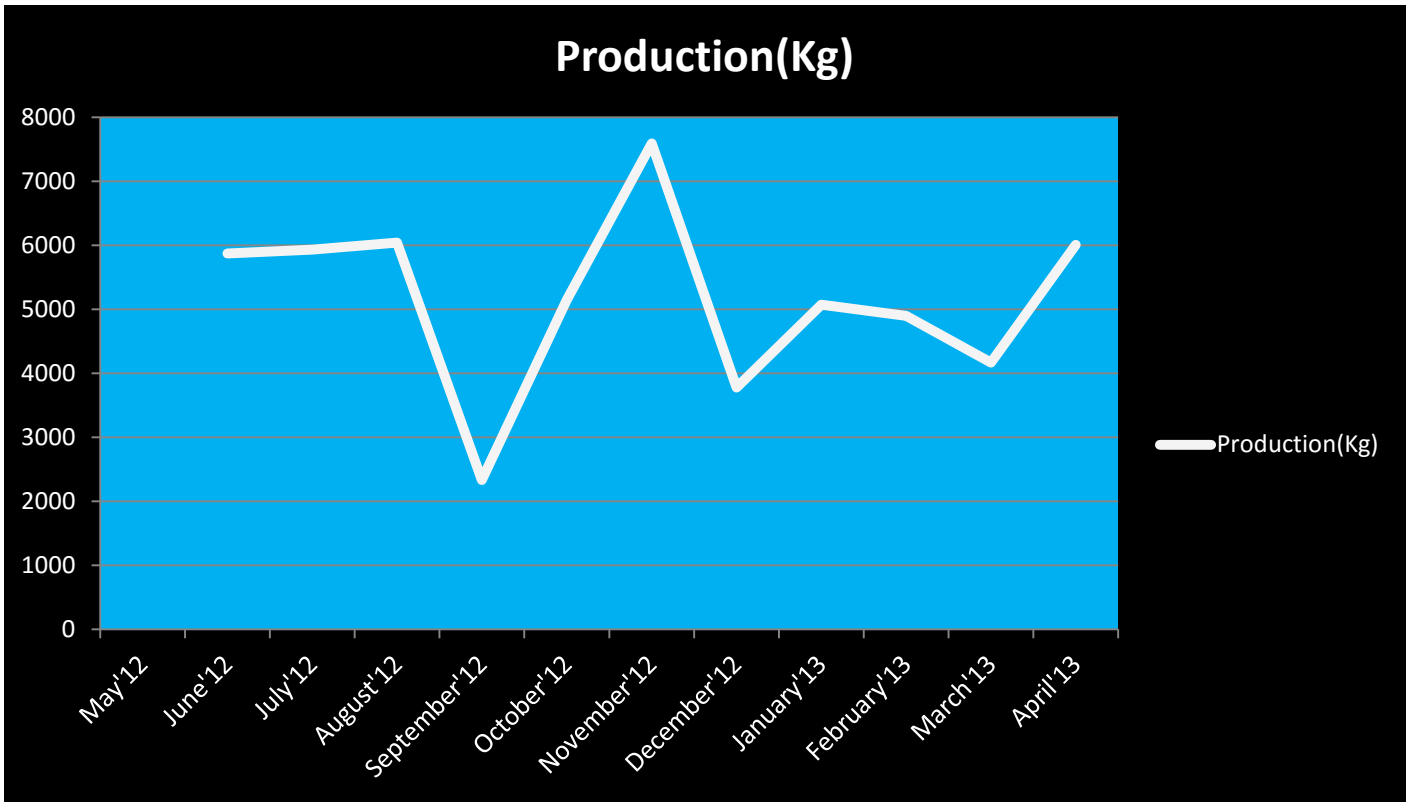
Month	Employment Generated (Man-days)	Trees saved in nos	Water Consumption (Litres)	40% Water saved by recycling	Enough for @750 litters /house hold	consumed Electrical Unit	Produced (Kg)
May-12	468	92	6,24,000	2,49,600	333	6,500	5,395
June-12	468	100	6,96,000	2,78,400	371	7,652	5,873
July-12	494	101	7,11,840	2,84,736	380	7,647	5,932
August-12	513	103	7,25,040	2,90,016	387	6,947	6,042
September-12	475	40	2,80,080	1,12,032	149	4,094	2,334
October-12	432	85	5,94,600	2,37,840	317	6,491	4,955
November-12	416	129	5,46,696	2,18,678	292	6,716	7,593
December-12	432	64	4,53,120	1,81,248	242	5,627	3,776
January-13	431	86	6,90,000	2,76,000	368	6,300	5,072
February-13	374	83	5,87,760	2,35,104	313	5,228	4,898

March-13	468	71	5,00,160	2,00,064	267	3,594	4,168
April-13	487	102	7,20,960	2,88,384	385	6,773	6,008
Total	5,458	1,056	71,30,256	28,52,102	3,804	73,569	62,046

Outcome-2012-13

- Electricity unit consumption = 1.18 units /kg
- fresh water consumption = 69 litters /kg
- Per capita production = 3447kg/year
- Job created = 5458 man days
- Trees saved = 1056nos
- Water saved = 28,52 102 litters
- Saved water sufficient for house hold = 3804 nos



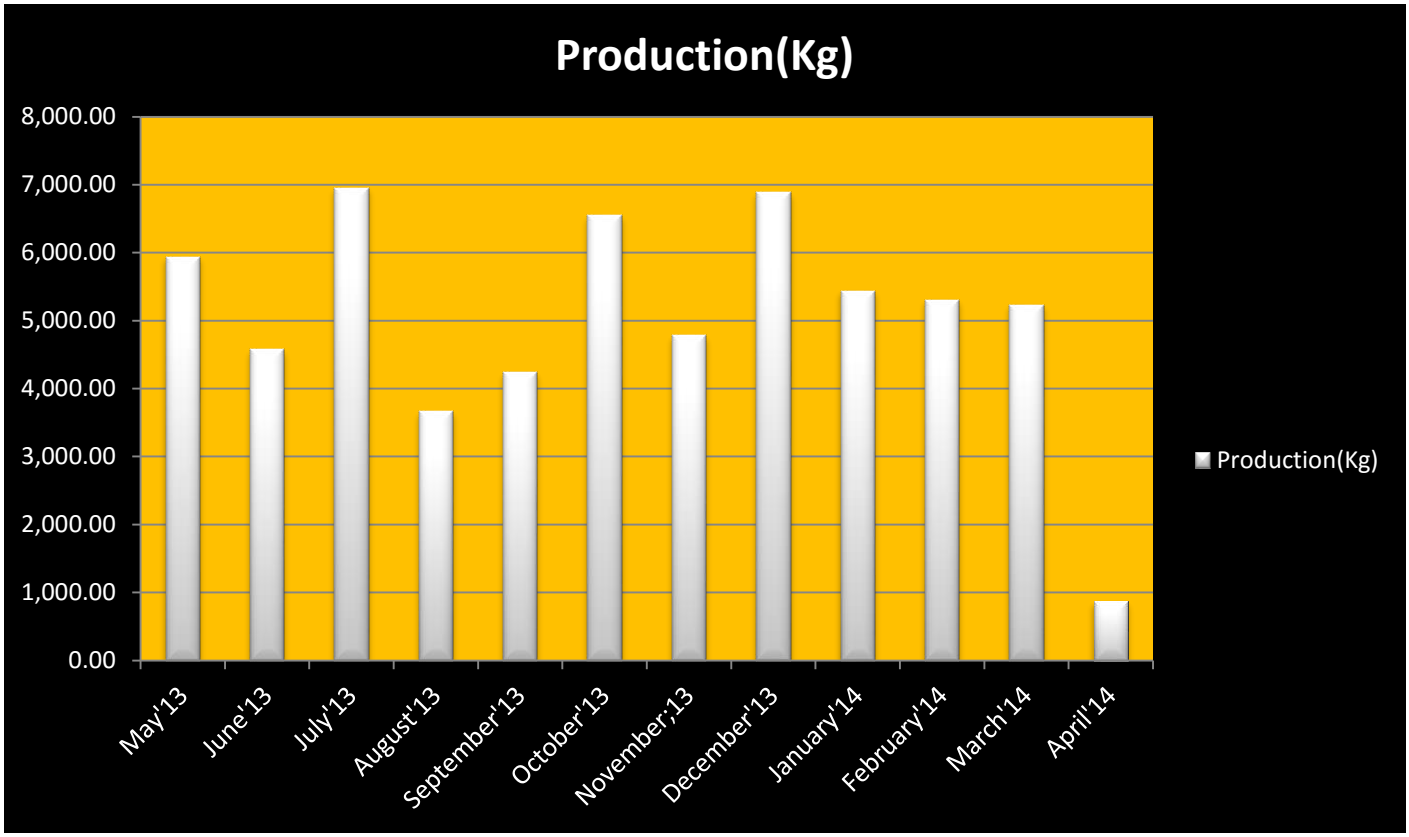


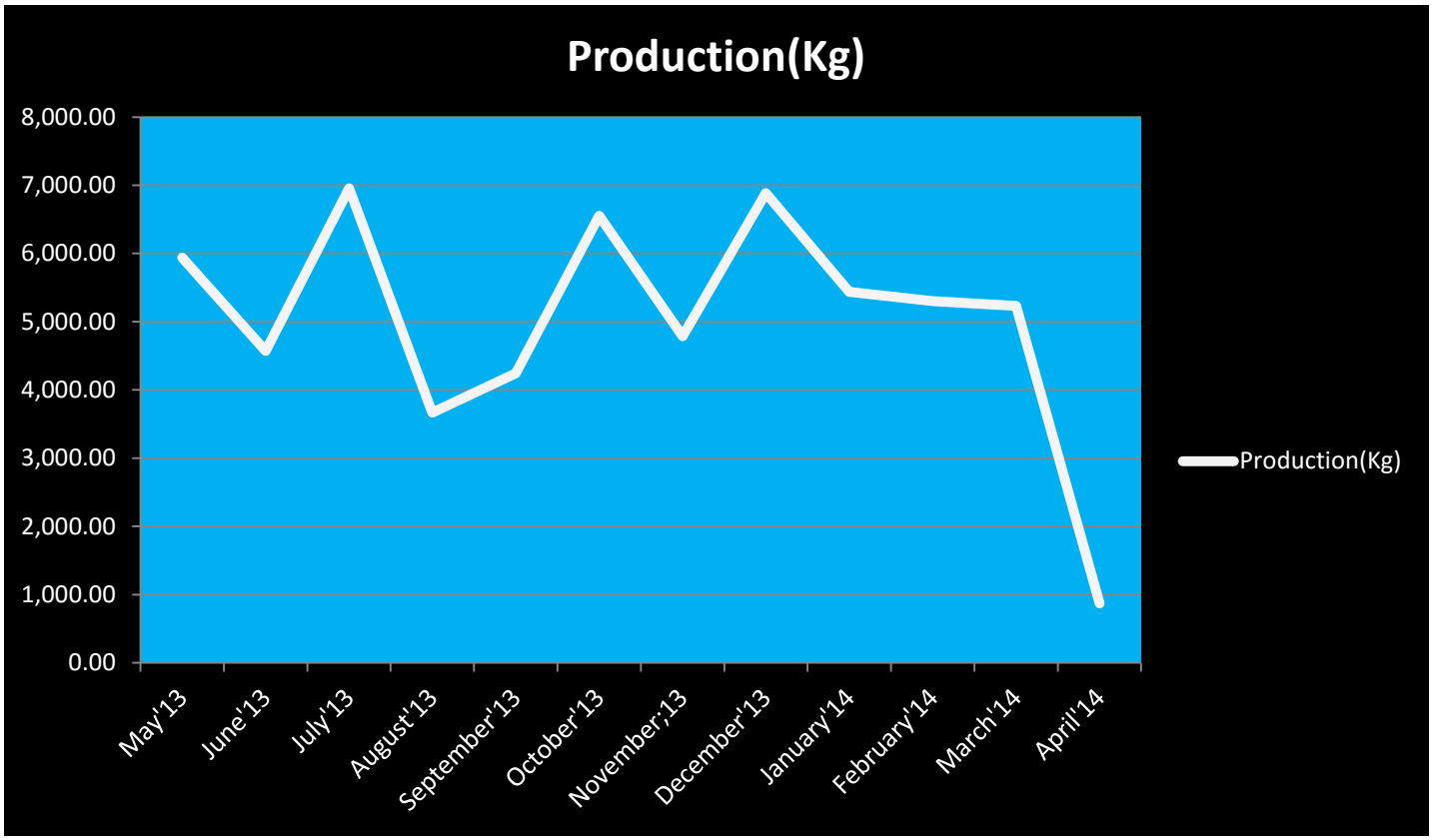
Annual production, job created and Environmental Saving -2013-14

Month	Employment Generated (Man-days)	Trees saved in nos	Water Consumption (Litres)	40% Water saved by recycling	Enough for house hold @750 litters	consumed Electrical Unit	Produced (Kg)
May-13	458	102	4,27,579	2,02,832	270	9006	5,938.6
June-13	491	74	5,48,700	2,19.480	292	7761	4572.5
July-13	502	118	5,00,760	2,00,304	267	8214	6955
August-13	475	62	2,64,024	1,05,610	140	6744	3667
September-13	495	68	3,05,402	1,22,161	163	7525	4241.7
October-13	495	111	4,71,888	1,88,755	251	8969	6554
November-13	451	81	3,44,520	1,37,808	183	7168	4785
December-13	518	116	4,95,648	1,98,259	264	9497	6884
January-14	508	92	3,91392	1,56,557	208	6870	5436
February-14	461	85	3,81,816	1,52,726	203	9497	5303
March-14	423	85	3,83,184	1,53,274	204	3594	5233
April-14	424	17	62,496	24,998	33	1783	868
Total	4708	1011	45,77,409	18,62,764	2,478	86,628	60,526.8

Outcome- 2013-14

- Electricity Unit consumption = 1.43 units /kg
- fresh water consumption = 45 litters /kg
- Per capita production = 3,362.5kg/year
- Job created = 4,708 man days
- Trees saved = 1,011nos
- Water saved = 18,62,764 litters
- Saved water sufficient for house hold = 2,478nos





Paper products Crafted and supplied in first year of the project -2012-13

S. NO.	PRODUCT NAME	MAY 2012	JUNE 2012	JULY 2012	AUG 2012	SEP 2012	OCT 2012	NOV 2012	DEC 2012	JAN 2013	FEB 2013	MARCH 2013	APRIL 2013	SUPPLIED TOTAL QTY
1	OFFICE FILE	2200	13246	15700	12050	3200	5930	10900	6600	1200	17585	16550	10438	115599
2	FILE FOLDER	100	7200	500	4900	1400	3050	2850	2000	800	2850	3355	3550	32555
3	DO/LETTER HEAD		101600	27500	4300	13450	91200	67650	700	60850		1000	49035	417285
4	GREY BOARD		126	600	350					1500	6800	400	2600	12376
5	ENVELOPE 9X4		8518	18336	1660	17721	12340	7285	50	3800	1060	7272	23060	101102
6	ENVELOPE WINDOW 10x4½		928	5870	915	12751	2120	15340			4740	2500	6830	51994
7	ENVELOPE 11X5		4622	19535	200	16491	6900	1510			2800	5130	21655	78843
8	ENVELOPE 10X12		5624	6871	1315	4210	8720	4900	50	3033		3957	8430	47110
9	ENVELOPE 10X14		2640	1994	1160	4645	7180	2114	50	2671	1040		7695	31189
10	ENVELOPE 12X16		7606	3984	1100	11770		770			2940	3784	8225	40179
11	SLIP PAD	65	4600	2000	4455	600	800	3200		3426	600	730	2900	23376
12	CARRY BAG	294	200					100		300				894
13	VISITING CARD	3700	3000	2000	8800	9000	5300	5300	3400	3700	3600	2400	2500	52700
14	TABLE MAT	65			10			9	5					89
15	ANNUAL MESSAGE								32000					32000
16	BILL BOOK						9							9
17	WALL CALENDER PAPER							56000	2950					58950
18	TABLE CALENDER PAPER							22000						22000

19	WALL CALENDER LEAF PAPER							10875						10875
20	WALL CALENDER ENVELOPS PAPER							2750						2750
21	COASTER	65					5	10						80
22	ISSUE PAGES	17100												17100
23	MAGNET SLIP PAD	65												65
24	BEST WISHES BOX	65												65
25	BADGES	60												60
26	COLORED FOLDER	1000												1000
27	IRCON CARDS	1000				400								1400
28	CHAIRMAN DINNER CARD		100											100
29	STICKERS		160											160
30	DELEGATES CARDS		125											125
31	ORGANIZER CARDS		30											30
32	CL/EL/LTC FORMS		5100		1500	1000	6700	2200		1600	1000	1000	8100	28200
33	BOOKLETS		2500											2500
34	CERTIFICATE		1000				1000							2000
35	FLIGHT PLAN FORMAT		1000											1000
36	TOILET SHEET		1000		2000	650	3000		2000	3000			1500	13150
37	ENTRY FORM			500										500
38	DIVIDER GREEN				500									500
39	PENCIL BOX				5									5
40	BROUCHERS				150									150
41	CORPORATE GIFT				20		15		200	10				245
42	ANSWER SHEET						200							200
43	PARLIAMENT QUESTION FILE							590						590
44	MEMBER VISITOR SLIP							200						200
45	PHOTO FRAME							5	30					35
46	MAINTENANCE FORM							2900						2900
47	MT-WORKSHOP FORM								1100					1100
48	KM OFFICE TICKET								1950					1950
49	INVITATION CARD WITH ENVELOPES								575	400		1430	250	2655
50	ENTRY PASS								250	1000				1250
51	NOTE PAD									50			50	100
52	FTC TAG										2480			2480
53	SEPRATOR											500		500
54	DINNER CARD											200		200
55	MMI PUMPLETS											10000		10000
56	MMI CHILDREN CARD												110	110
57	MMI PROSPECTUS												35	35
58	MMI BROCHURE												25	25

Pollution Free:

No hazardous/Toxic chemicals are used in the production process, only the waste water is generated which is fertile in nature, thus enabling its use in irrigation for plants and lawns.

THE EQUIPMENTS ENGAGED IN PAPER RECYCLING:



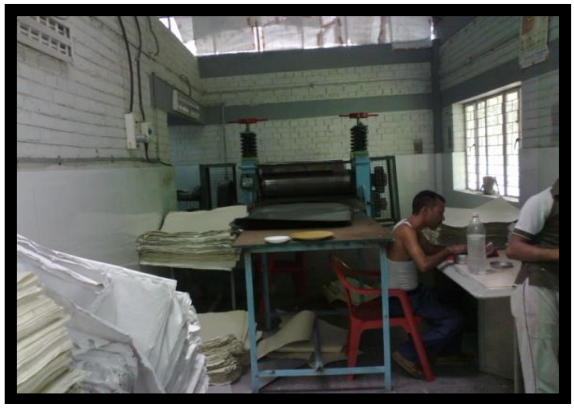
Hollander beater machine



Cylinder mould machine



Natural paper drying



Calendaring of paper sheets



Semi-automatic Cutting m/c



Crafting of paper products

Scope for paper recycling partnerships-

There is a large, unexplored wealth of waste cellulose materials and paper waste emanating from different offices/industries/institutions/schools and colleges. Although systems exist for the recovery and recycling of major waste higher value addition can be achieved by internal recycling within the institutions generating the waste.

This will require the creation of partnerships with expert groups /institutions for integrating recycling technology with social objectives in an economically viable manner. Such partnerships need to be researched, and 'their wide-scale acceptance amongst existing industries promoted.

Innovative production systems-

Paper recycling and handcrafted paper production is amenable to decentralization. Through research& demonstration, recycling facility based exclusively on local production of waste paper and waste cotton could be planned. Future small, decentralized units can easily be installed in any parts of country with limited access to water and electricity and can create the opportunity for sustainable livelihoods for poor people and increase green foot prints. The part of the production system that requires small capital investments, and may thus benefit from economies of scale could be based in urban areas and integrated with the current need and demand.

Special Achievements:

Society for Integrated Sustainable Development efforts and performance is reflected by various awards and recognitions that greeted this project and contributed to building the 'green' reputation for Airports Authority of India, as mentioned under:

1. Airports Authority of India was conferred with national highest environmental award: **"GOLDEN PEACOK ECO AWARD -2012" for Environmental Conservation.**

2. The paper recycling unit is certified with **ISO 14001:2004, signifying superior standards of quality systems.**

3. A**irports** A**uthority of India** I was also conferred with **"3rd ASIA BEST CSR PRACTICES AWARD -2013** "under tenure **of Society for Integrated Sustainable Development.**