

# Can Mini Paper Mills be Viable?

by Abdul Wadud

**Mini paper plants are viewed as an effective remedy to boost investment in paper sector. They involve much less capital costs and are proved to be technically feasible and economically viable for production capacities in the range of 10 to 20 MT per day.**

**T**HE per capita consumption of paper and board in Bangladesh is about 2 kg. In India or even Afghanistan having similar socio-political environment the per capita consumption of paper is over 3 kg. So in order to raise the consumption level at par with those of regional countries the existing domestic production level has to be raised significantly. The pulp and paper sub-sector is now open to the private sector. A number of paper mills have also come in the private sector. But number-wise, it is very few. The main reasons that more number of mills are not coming up are high capital cost of the plant and dearth of technical know-how in building and operating such plants.

Mini paper plants are viewed as an effective remedy to boost investment in paper sector. They involve much less capital costs and are proved to be technically feasible and economically viable for production capacities in the range of 10 to 20 MT per day. Mini paper plants can be erected on the basis of fully indigenous expertise, know-how and machinery. Moreover, non-conventional raw materials such as waste paper, rice straw, wheat straw, bagasse, jute cuttings, *hababibi* etc., may be used in such mini paper plants, thus easing considerably the burden on the conventional raw materials like wood, bamboo etc.

**G**rades of Paper that may be Manufactured: A number of grades of paper and paper board can be manufactured in a mini paper mill. They include writing and printing, liner and fluting media, wrapping paper, folding box board, solid board etc. All these grades of paper have high demand in Bangladesh. The present demand of writing and printing in the country is about 80,000 MT per annum. The supply from both public and private sector mills is about 60,000 MT per annum. The gap is either met by imports or substitution by lower grade, like newsprint.

There is a great demand of liner and fluting medium in the country. These are used in making corrugated boards. The cartons made of corrugated board

are widely used in packing garments, frozen foods, TV, soap, cosmetics etc. The demand of fluting and liner is above 100,000 MT per year. Bulk of this product is used for export of garment and frozen food. The domestic production will not exceed 30,000 MT and the rest is imported through back to back L/C. Wrapping paper has also very high demand in the country and the demand is rising every year. The present requirement is about 20,000 MT. The present manufacturers are at a loss to supply this huge quantity. Brown packaging paper including fluting media, liner, wrapper etc. are the most suitable products which can be specifically manufactured in Mini Paper Mills.

**R**aw Materials: Cellulose fibres are essentially the basic component of paper. The raw materials which abundantly supply cellulose fibres are naturally recurring woods, bamboo, annual plants like straw, jute fibre, green jute. Mini paper plants are generally built keeping in view of specific objectives e.g., minimising investment cost, utilisation of locally available raw materials, feeding a particular market demand of paper etc. The raw materials generally used for mini paper plants are e.g. bagasse, rice straw, jute cuttings, waste wood in the match factory. All these fibrous raw materials can be successfully used in making different varieties of paper.

**B**agasse: Bagasse is a proven raw material for making writing, printing and newsprint grades of paper. There are 16 sugar mills in the country which produce bagasse as waste. This waste has, of course, other value. It is used in the boiler of sugar mills. But there are some sugar mills which have some surplus bagasses even after meeting their own requirement

for the boilers. North Bengal Paper Mills collects bagasse from different sugar mills for its own use. However there are sugar mills in the far flung areas of Northern districts from where the bagasse cannot be economically transported to NBPM. These sources of bagasse can be tapped for mini paper plants which should be located in the vicinity of sugar mills in order to keep the transportation cost at the minimum.

**S**traw: Rice and wheat straws are available in Bangladesh. The availability of straws for a mini-size plant is not a problem though collection and transportation pose some difficulty because of high bulk density and sources of supply being so widely spread. Straw fibre may be used for manufacturing white writing, printing paper with additional furnish of some quantity of virgin pulp. Straws are widely used for making solid straw boards.

**J**ute: Jute is a suitable raw material for pulp and paper. Both jute fibre and green jute can be used for manufacturing paper depending on the grades being manufactured. Jute is suitable for making writing, printing paper, bond paper, security paper, envelope paper etc. However, for making these grades, a small quantity of kraft virgin pulp to the extent of 20-30 per cent may have to be used. Green jute pulp is suitable for making wrapper, liner and fluting media, file board etc.

For minimising the cost, jute cuttings and lower grade jute are recommended for using in mini paper plants. Green jute is used during the harvesting season from August-October. Green jute having moisture content of above 60 per cent suitable for handling, chipping and cooking. If it is dried further, the bast fibre and woody portion separate out. These two fibres have different characteristics

and hence create problems in transporting, cutting and cooking. The other raw materials which can be used include rags, waste paper, *hababibi* from jute mills, etc. Each raw material is cooked with an aqueous solution of caustic soda at elevated temperature to yield pulp of relatively pure cellulose. The

Agricultural residues and crops considered suitable for paper manufacturing

Residue/crop Bagasse	Paper grade Newsprint, writing & printing papers, kraft-grades
Straw (rice, wheat)	Writing & printing paper, liner board, corrugating media
Jute Sun hemp grades	Liner, fluting media, wrapping Hard tissues, cigarette paper, specialty

**M**anufacturing Process: The manufacturing process to be adopted in a particular paper mill depends largely on the type of raw materials being used as well as the grades of paper to be produced. Mini paper mills normally use non-woody fibres and the products produced include wrapper, liner and fluting, straw board and to some extent writing and printing paper. The processes which are generally adopted for mini paper mills include the

**L**ime Process: This process is carried out for pulping straws. It aims at obtaining semi-chemical pulps suitable for corrugated board making varying CaO make up, temperature, liquor ratio and digestion time. The lime make up varies between 6 and 25 per cent the temperature between 150°C and 170°C and digestion time between 3 and 7 hours. In this process temperature is the active factor for solubility of organic matters.

**S**oda Process: Soda process is suitable for all agricultural wastes like bagasse, straw, jute cutting, green jute etc. A wide variety of products including

sodium hydroxide used is 15-20 per cent of the BD of the raw material. The cooking time is 3 hours and the working pressure is 150 psi, temperature 160°C.

**R**eccovery of Chemicals: Recovery of used chemicals is the heart of economics of a pulp and paper mills since in a paper mill with conventional system about 90 per cent of the chemicals used is recovered and ploughed back in the system. A further reason for considering the installation of a chemical recovery system is to lessen the load on the waste water treatment.

With the reduction in size in the plant, the feasibility of recovery system is reduced because of concomitant effect of high capital cost of equipment and lower efficiency of recovery of chemicals. It has been found that installation of recovery system in a mill below capacity 100 MT/day is not technico-economically feasible.

A mini paper plant cannot have expensive recovery system for obvious reasons of high capital costs and lower efficiency of recovery of chemicals. In comparison to a large one, a mini paper mill usually does not require expensive facilities for pollution control measures. On the contrary, there are small soda-based mills, especially in Asia, which neither have nor require any mill-effluent treatment plant. The black liquor from these mills is often reused. In the process of reusing when the reject content is high, these black liquors may be released, to paddy fields, where it is used as fertiliser.

For the positive effect of soda-black liquor from straw mills as fertilisers for rice plantations has been confirmed in several studies. Experiments show that the effluent of paper mills if properly treated can be used for irrigation. Land requirements are 40-50 acres per million gallons per day of effluent.

The combined effluent of the pulp-mill and paper-mill is given primary treatment to remove suspended solids. After the removal of suspended solids, the waste water could therefore be used for irrigation during the dry seasons when farmers demand for water is high. During the rainy season when there is no demand the effluent could be effectively mixed with the storm water and discharged with no ill effects into the environment.

In most mills in industrial countries the suspended solids and sludge are used either as land fill or incinerated after a process of thickening. In a developing country like ours, there is a need to stimulate the rural economy. The sludge

could be mixed with screen rejects and waste paper to produce solid bond on a single cylinder wet-board machine. The sheet thus formed could be pressed hydraulically and sun or air dried to produce heavy weight board for use in book-binding or as suitcase boards for the manufacture of rigid boards.

**D**esign and Engineering: The design of a mini paper mill should be simple, sturdy and maintainable easily. The following points may be helpful: a) Metallurgy: is given high emphasis; no compromise is taken in this area although it means a little higher capital cost.

b) Direct drives with gear box and flexible coupling are preferred, as they work even with slight errors of alignment.

c) All major equipment should be able to be maintained locally.

d) The mill should have a lathe machine capable of coping with the longest and largest of the appliances in the mills.

e) Special metal-spraying equipment should be stocked for metallising and building up worn part without distortion.

f) There should be less automation.

g) With limited manpower skills, sophisticated instruments are to be avoided.

Some of the advantages of mini paper mills are enumerated below:

1) The agricultural residues and other waste materials, which are traditionally thrown away or burnt will be used by mini paper plants.

2) The quantity of raw materials required for such small units being small, it can be easily managed from different sources.

3) The plants can come up throughout the country by fixing up the site where the raw material is available. This will also decentralise the large industrial centres from one place and will provide employment and economic boost in different regions of the country.

4) The project cost being lower, the return on investment is more.

5) Small units can be set up in backward districts in various parts of the country. This will help in boosting up the economic condition of the region.

6) As the requirement of water and power is less for small units, the same can be easily met at most of the locations.

7) The procurement of plant and machinery is easier as it can be arranged from the indigenous suppliers and the delivery period is shorter.

8) The requirement of foreign exchange is less.

9) Technical know-how is easily available and the gestation period is smaller compared to larger units.

10) Management, operation and marketing are easier and controllable.

**C**onclusion: The purpose of this paper is to provide some points for discussion on the important question: can viable mini paper mills be built in Bangladesh, if so, how? In the case of simple processes involving waste paper and agricultural residues, the answer would be positive. It can be seen that savings in costs could be achieved by stripping the mill of equipment which are not absolutely essential for the operation. If the operation is well managed, a profitable enterprise could be materialised.

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# Call for Spam to Scram in E-Mail Jam

Developments in communications technology have turned junk mail from a minor nuisance into a major inconvenience for Internet users. In her latest column on the global computer network, *Gemini News Service* correspondent Arlene Getz writes on efforts to stem a tide of useless information.



then using it for a few days to send tens of thousands of messages to private e-mail addresses and Usenet groups.

"No other kind of advertising costs the advertiser so little," say the organisers of one of a growing number of anti-spam sites set up on the World Wide Web. The site (located at <http://www.spam.abuse.net>) compares spamming to "auto-dialing junk phone calls to cellular users."

Most unsolicited messages, according to the anti-spam site, are advertisements for items such as dial-a-porn services and "stuff that's entirely worthless, deceptive, and partly or entirely fraudulent".

Says Internet user, J D Falk, in a posting on the Web: "Spam doesn't mean ads, it means abuse."

On at least one occasion, spam was used for a personal vendetta by a user who e-mailed a child pornography advert to millions of people around the world. The hoax message falsely named an American man as the porn peddler in an apparent attempt to damage his reputation.

Some people are now seeking legal remedies to the problem. A group called the Coalition Against Unsolicited Junk E-mail is putting together a legislative proposal aimed at adding spam to an existing US law prohibiting junk fax transmissions.

Anti-spam activists have been working on filtering techniques. Baroudi says a software programme installed on her computer system by a colleague managed to block a backlog of 12 million spammed messages.

"Ordinary junk mail is a nuisance, but at least you can usually tell what it is from the envelope and throw it straight in the recycling bin," she said recently. "The problem with junk e-mail is that there's no way to distinguish it from legitimate e-mail without opening up and reading it. Even if you're a really fast reader, that wastes a lot of time."

Spamming costs the receiver more than it does the sender. Most Internet users have to pay both their service provider and their phone company for online time and few want to prolong this period because junk messages are being downloaded into their electronic mailboxes.

On-line companies, too, have encountered problems when their networks and disks become clogged with unwanted mail.

Managers at America Online (AOL), for example, found they were "relaying" 1.8 million spams a day from Philadelphia-based Cyber Promotions.

AOL, the largest one-line service provider in the US, had to allocate staff to deal with these messages as well as with angry customers who had received them.

In the end, AOL successfully applied for a court injunction to stop Cyber Promotions' bulk e-mailing of AOL subscribers.

Some spammers have resorted to a hit-and-run tactic that involves repeatedly signing up for a free one-line trial,

The writer is a former southern Africa correspondent, now based in Boston.

## Tom and Jerry



## Manikganj by-polls free, fair: FEMA

By Staff Correspondent

The Fair Election Monitoring Alliance (FEMA) said Tuesday that the June 30 by-polls in Manikganj-3 constituency of the Jatiya Sangsad was well administered and peaceful.

FEMA said its volunteers during observation, found magistrates and other government officials present in each polling station during the polling. Presence of law enforcing personnel was adequate, the NGO said in a press release.

Barring some irregularities, said FEMA, the election was free, fair, transparent and impartial. Citing some irregularities, it said a large number of

## More donations to PM's Relief Fund

Officers and employees of the Ministry of Defence and attached departments and organisations donated Taka 3.95 lakh, equivalent to their one day's salary, to the Prime Minister's Relief and Welfare Fund, an ISPR press release said Tuesday.

Cheques for the amount from Bangladesh Meteorological Department, Directorate of Military Land and Cantonments, Survey of Bangladesh, Bangladesh Freedom Fighters' Welfare Trust, Space Research and Remote Sensing Organisation, Bangladesh National Cadet Corps, Ministry of Defence Constabulary, Chief Administrative Officers' office, Cypher Directorate, inter-service public relations directorate and the ministry were sent to the Prime Minister's office.

134 participants from the South Asian countries attended the conference.

The other members of the Bangladesh delegation were: ASM Mannan, Secretary General, Kisholay Sangsad, Md. Sukar Salek, President, Dhakaabasi Organisation, Monir Hossain, President, Young Life-Bangladesh, Shireen Sultan, Vice Chairman, BSWWA, Hasan Zamam, Chairman, VOA Fan Club and Shaikh Khoda Bokh, Joint Secretary, Nabarun Sangha.

## NilG board of governor meet held

LGRD and Cooperatives Minister Zillur Rahman yesterday expressed the hope that the proposed *gram parishad* and *upazila parishad* would play a stronger role in the alleviation of poverty, reports BSS.

Speaking at a meeting of the board of governors of the National Institute of Local Government (NILG) in its auditorium the minister said each of the local government structure would be utilised more effectively and efficiently at the grassroots level to help alleviate poverty, create employment opportunity and preserve environment.

Rahman said that a process was on to take up a project under UNDP assistance to increase internal resource mobilisation for making the union councils more self-reliant financially and to enhance the supply of domestic resources in the local development activities.

The objective of the project, he said, was to increase efficiency of the elected representatives of the local government structure.

It was informed in the meeting that the institute organised 74 training programmes and workshops last year for the local government institutions at the grassroots level.

Secretary of the local government division A H M Abdul Hye, director general of NILG and members of the board of directors attended the meeting.

Later, the LGRD and Cooperatives Minister planted a sapling at the NILG premises.

The meeting approved the

budget of 1996-97 unanimously, the press release added.

### BPHC

Bangladesh Health and Population Consortium (BPHC), a donor organisation, held a workshop at BARD, Comilla, recently to formulate recommendations and action plan to further improve and strengthen issues of capacity building process, quality of care issues and cost effectiveness of existing MCH-FP programmes, says a press release.

The 3-day workshop was attended by 96 participants from the 47 BPHC funded NGOs, donor representatives from UK Dept of International Development (formerly ODA), CIDA and Mitford Hospital Chowdhury Wahidur Rouf also spoke.

The function was chaired by Dr Asadul Huq Khan.

Zillur Rahman said the present government is determined to develop a village-oriented medicare system in the country for reaching the treatment facilities to the doorsteps of commoners.

He referred to several steps of the government in health sector, including upgradation of five new medical college hospitals from 250-bed to 500-bed ones in the last one year.

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