

A Comparative Study of Mother Paper Mills V/S Integrated Pulp & Paper Mills

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The comparison is based on the following.

- 1) In and out transport of raw materials and finished goods;
- 2) Processing sequences; and
- 3) Reuse of process wastes

Transport

In spite of the best efforts being made, the transport facilities in India are still in infancy. Not to talk of interiors, even the areas connected by Railways, Roadways, etc. do face serious problems of transporting goods from one place to other. And whatever efforts we may make, transport of goods is going to remain a big bottleneck for heavy industries in India for quite some time. Manufacturing facilities for transport equipment, availability of suitable material for building, Railways, Roadways, etc. and the size of the country are some of those problems which cannot be solved by comparisons. Hence, any project involving double/triple transportation will not only face difficulties for regulated supply but will unnecessarily increase burden on already

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A comparative study of the "mother" pulp mill and the integrated pulp and paper mill has been made. In India, a paper mill is generally required to produce pulp for its conversion into paper. The idea of "mother" pulp mill is to produce pulps of required quality for being converted into paper in a number of (small) paper production units. The project has its own advantages in the context of the present economic set-up of the country.

deficient transport system.

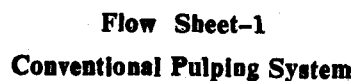
To elaborate this, let us take a typical example of a 500 T/D pulping unit situated at some rail-head and also in the centre of forests supplying raw material for pulp. For the present we shall assume that the other three factors, i.e. the processing system, consumption of utilities and reuse of process wastes, favours well while comparing the economics of mother pulp mill with an integrated pulp and paper mill. Even from the angle of transport costs also, if we assume that all the incoming supplies to the independent mother pulp mill with scattered paper mills and the integrated pulp and paper mill will balance (though this assumption will hardly be correct), then too the transport of pulp to the consuming paper mills which may be situated at an average distance of about 500 KM, we shall have an extra burden of at least $500 \times 500 = 250000$ KM tonnes per day on

transport. Over and above this, there will be double handling, i.e. for approximately 1000 tonnes per day (500 T/D loading and 500 T/D unloading) and double storage place will be required. Only if these three extra items are calculated in terms of money, it will cost nearly Rs. 100/-tonne. If the distances are more and road transport is used to move the pulp to paper mills, the cost may go up to Rs. 150/-tonne. As has already been said that all these figures are based on assumptions and the assumptions may go off by any amount. Hence, it is essential that a test case of a suitable size integrated pulp and paper unit in an area where the basic raw material like bamboos, hardwoods, bagasse, etc. are available in economic distance range is taken and its comparative costing is made to find out the economics of transport, against a non-integrated unit, a much better picture

Processes

- 1) Formation of pulp cakes, drying, baling and packing at the mother pulp mill;
- 2) Repulping of pulp cakes at paper mills; and
- 3) Only partial recycling of fines and process effluents.

While considering the process flow, the Author has considered multipurpose production units for obvious reasons. It can be seen that the system gives all the



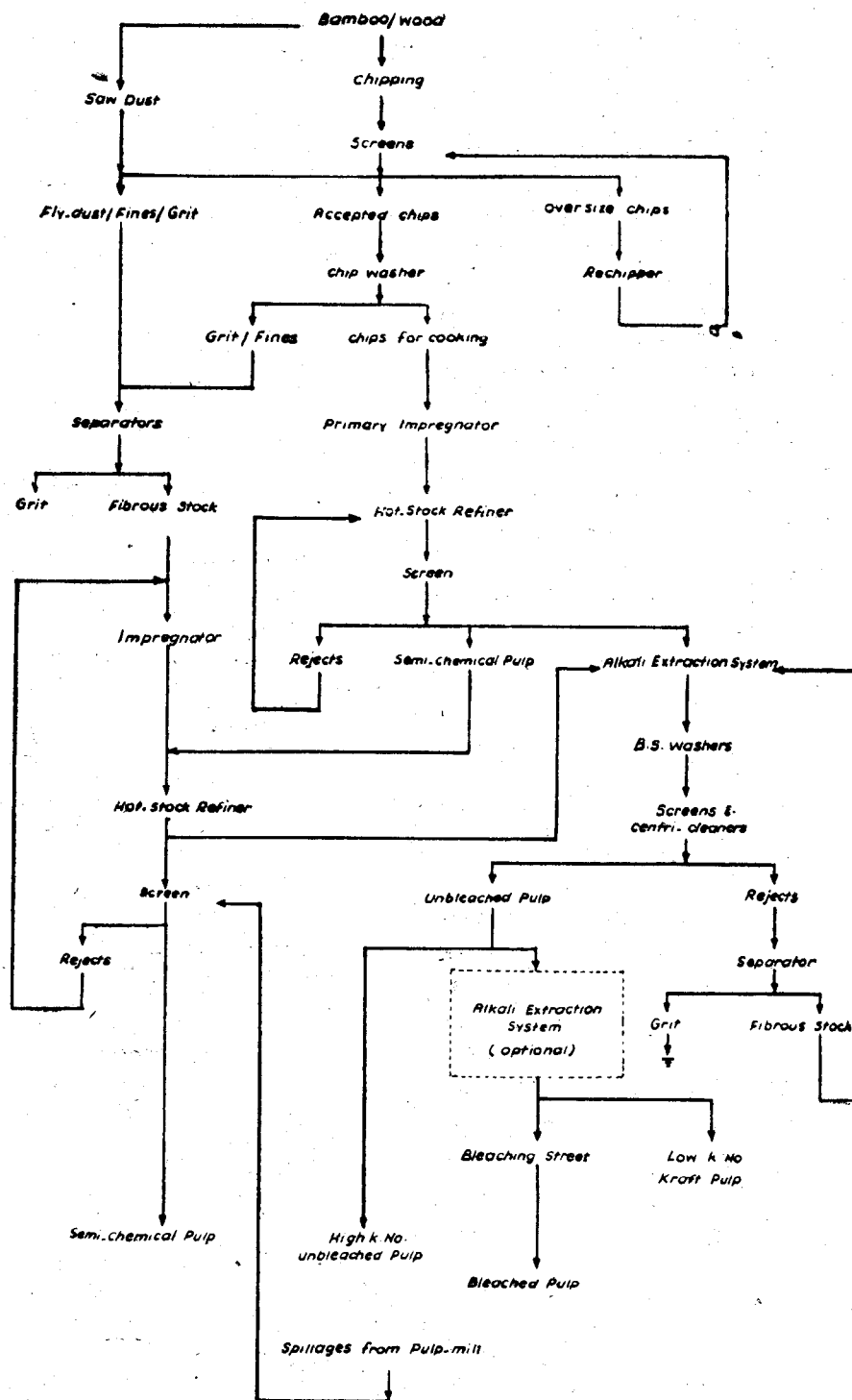
flexibility for making different types of pulps for various grades of papers which, otherwise, will not be economically feasible if non-integrated units are installed.

Reuse of Process Waste

The following major process wast-ages are accounted for while com-paring the processes of non-inte-grated units against integrated units.

- 1) Saw dust and fine bamboo dust.
- 2) Spillage loss from pulp mill.
- 3) Spillage and fines loss from paper machines.
- 4) Lime sludge from Hypochlo-rite preparation and caustici-zer plants..
- 5) Mixed waste from machines and stray sweepings.
- 6) Heat loss from Blow Tanks, Evaporators, Boiler and Power House, etc.

Various flow sheets attached with this note indicate the possibility of reusing the process wastes for much better advantage if the units are integrated rather than non-integrated ones. In fact, quite a few of these recycling systems for process wastes are being used in many integrated mills and the process waste of one area, if suitably treated, and reused in the other area. This reuse of waste will give definite advantage in increasing the yield, reduction in utilities consumption and super- vision costs. Over and above this, threatening problems of environ- mental pollution will also be con- trolled economically.



Flow Sheet-1A

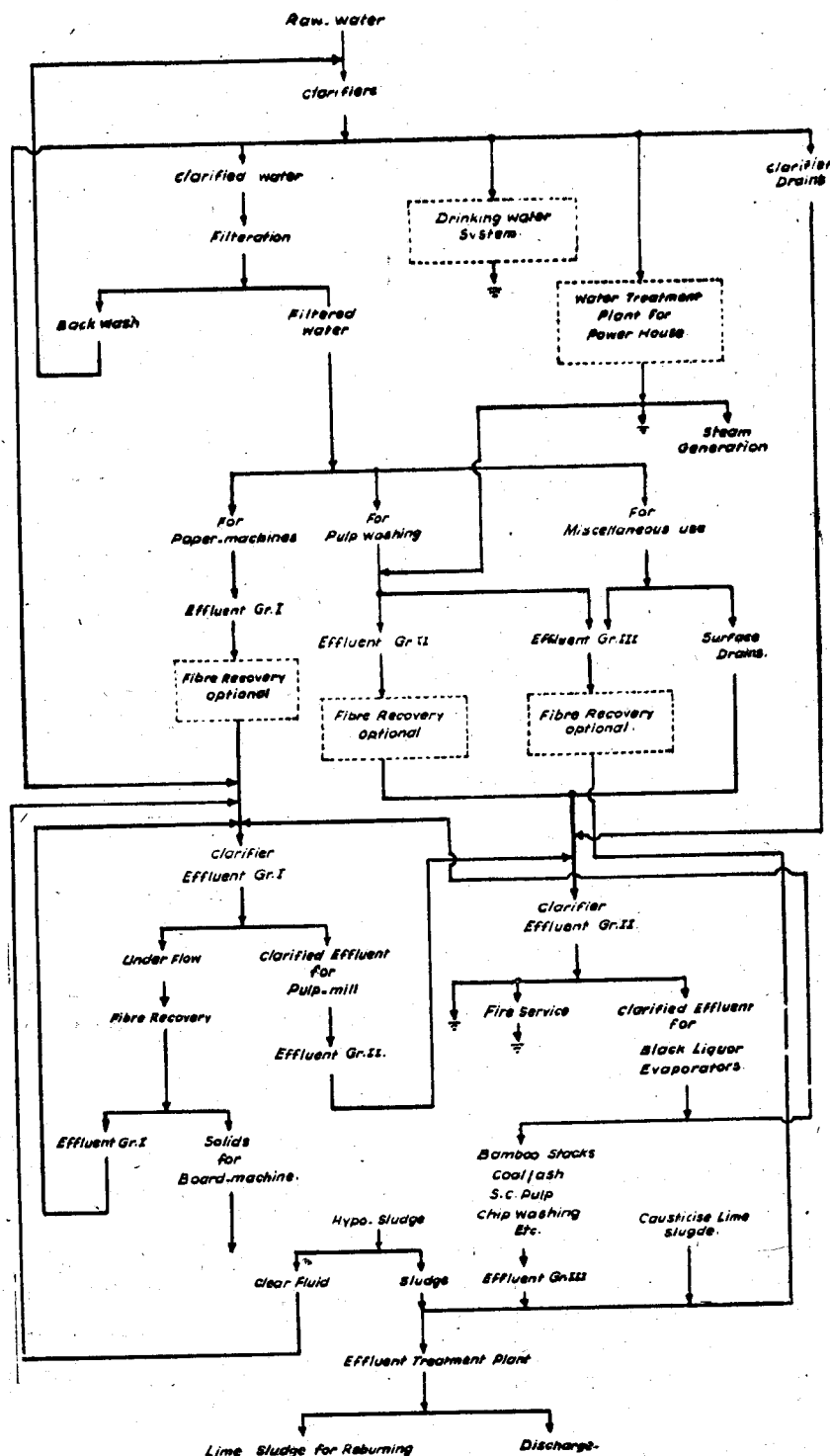
Multi-Stage Pulping System

Conclusion

Success of a project depends upon its practical feasibility and not on its academic blue-prints. The plans should keep in view the socioeconomic conditions of the country and should not only depend upon the future projections. The need of the day is to produce more paper and create conditions for quick development of the industry. We have our own limitations and our object should be to get the best out of what we have and what we can produce. Plans for highly mechanised and sophisticated mass production units for which we are not well equipped, will only delay the progress. According to the information available, medium/small units with conventional lay-outs and equipments are the best solution for us. If we look from economic angles, the Author feels that even the so called integrated pulp and paper units are not the end. We should plan self-contained units having at least—

- A) Pulp Mill
- B) Recovery Plant
- C) Paper/Board Machines
- D) Caustic Chlorine Plant
- E) Lime Kilns
- F) Self sufficient power plant to have smooth working.

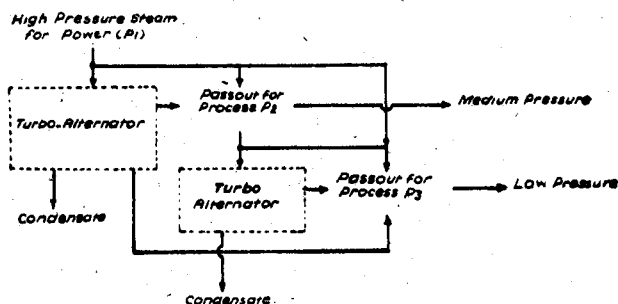
The pulp mills should be so planned that they are able to cater the need with suitable pulp for all paper and board machines. In this way, the waste paper will be left out for smaller and scattered paper mills. The caustic chlorine plant should have ample



Flow Sheet-2
Water Balance

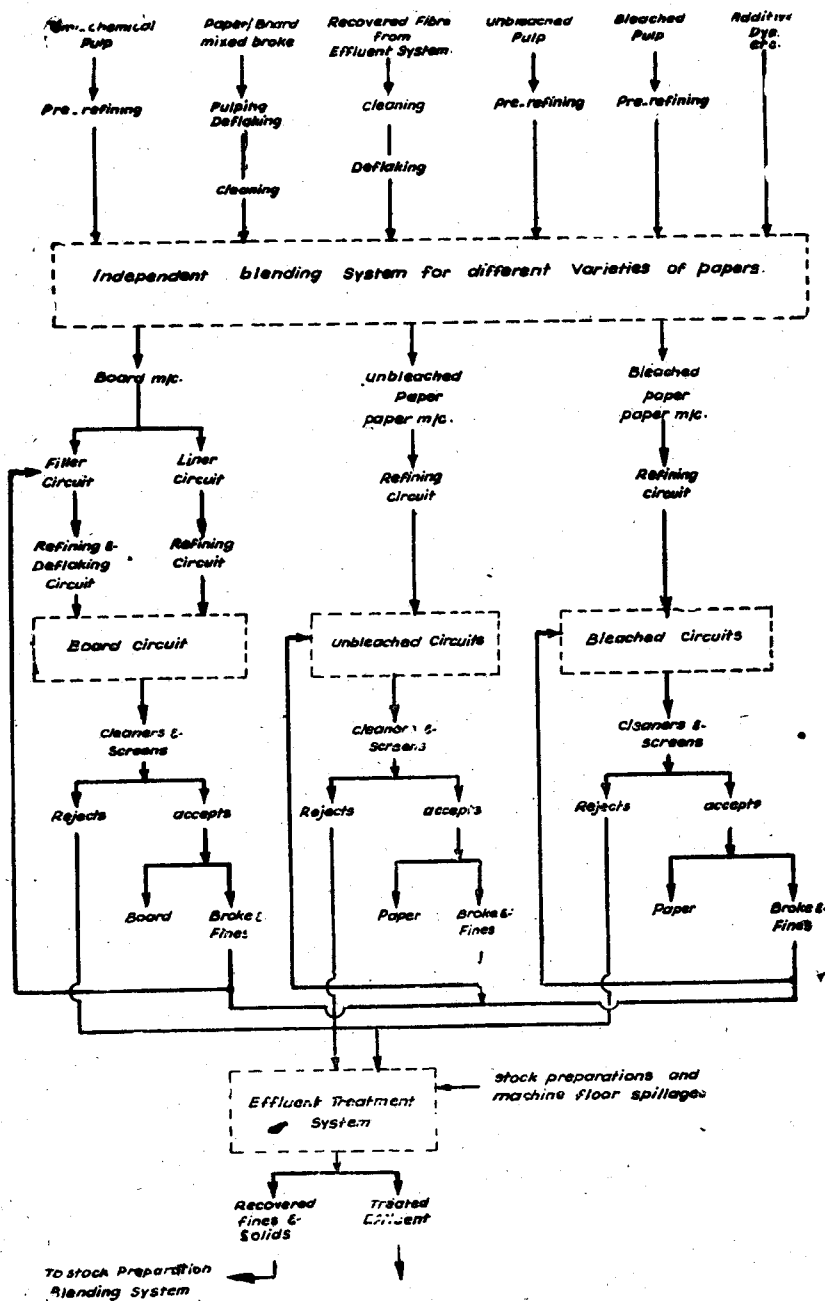
As such, the Author is of the opinion that the best course for expeditiously developing the paper industry in India will be to—

- 2) Plan different pulp, stock preparation and machine cir-



Flow Sheet-3

Heat Balance



Flow Sheet-4
Stock Flow & Recovery System

culits to produce different varieties of paper and boards in the same integrated unit.

- 3) Standardize the most efficiently working equipment and parts which can be manufactured in the country so that their multiples can cope up with the required production and installations.
- 4) Facilities should be created to manufacture the imported specialised equipments in the country to reduce dependance on imports. This can be best achieved if the machine manufacturing industries are broad-based rather than leaving the paper mill machinery manufacture in the hands of a selected few.
- 5) Small paper/board machines to produce quality papers and cheap boards may be scattered all over the country and use waste papers, rag fibres and any other raw material.