

Productivity In Large Paper Mills

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SYNOPSIS

Productivity is the corner-stone of industrial growth and economic development. Higher productivity means the available resources are more and more efficiently utilised. This has greater significance in developing countries like India where the resources are scarce, especially in Paper industry with its specific problems of raw material, energy, capital and men. Productivity can be viewed in terms of material, labour and capital and if properly monitored making use of up-to-date management techniques, would help in improving the existing low capacity utilisation which is the need of the hour.

The higher productivity would help a great deal in removing the present sickness of the industry and would also meet the challenge of Forest Raw Material shortage, Energy Conservation and minimum pollution simultaneously meeting the growing demand for paper. The task is though difficult not impossible.

In view of the importance, all concerned i. e. Management, Employees, Consumers and Government should join hands in this national task of improving productivity in Paper Industry to cure the sickness and ensure healthy growth, so that we can confidently enter the 21st Century with a sense of achievement and pride.

Productivity is the corner-stone of industrial growth and economic development. Productivity in the simplest sense means production per unit factor and the progress of the Unit is judged not by how much it produces but how efficiently it produces. Higher productivity means that the available resources are more and more efficiently utilised. This has greater significance in developing countries where the resources are scarce. Productivity has to be a national movement since every individual has to contribute. Productivity is something that we owe to the Nation, we owe to the Society, we owe to the Organisation and we owe to Ourselves.

In a developing country like India, especially in Paper Industry with its specific problems of raw material, energy, capital and men, productivity has a great significance.

Productivity can be broadly viewed in terms of (i) material (ii) labour and (iii) capital and let us examine how it can be applied to the paper industry especially large paper mills.

The major problems facing Indian Paper Industry

today are shortage of correct type of raw materials and its higher prices, heavy raw material royalties and power tariff, energy shortage i.e. power, coal etc., financial inadequacy and absence of efficient management. All these have resulted in bringing down the capacity utilisation of paper industry to about 60% and also resulted in low productivity and profitability leading to closure and shut-down of several mills. Unless corrective steps are taken immediately the situation is likely to deteriorate further and the paper industry may become sick similar to the condition of textile industry. Higher productivity can help the situation to a great deal in removing the sickness and will also meet the challenge of Forest Raw Material shortage, Energy Conservation and minimum Pollution. The task is, though difficult not impossible. All concerned, i.e. management, employees, consumers and government should join hands in this national task to improve the productivity in paper industry to cure the sickness and ensure its healthy growth. In this context it will not

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be out of place to quote our Prime Minister Shri Rajiv Gandhi while inaugurating the 66th general council meeting of the Indian National Trade Union Congress in New Delhi in Sept. 1985 :

“Productivity really is a pivotal issue. You have talked about a bonus season, why don't we talk about the productivity season? Productivity season lasts all four seasons. Ultimately whatever bonus you get, and whatever benefits you get, have to be paid out of productivity. They can come from nowhere else. There cannot be handouts, there cannot be welfare in industry. You must earn what you get, and I don't mean just your salaries but the total package that industry gets, must be earned by industry. Again I am not separating labour and management. And this can only be done with higher productivity. Higher productivity does not mean that only labour has to do more. It is again an exercise for the whole industry to go into. It may be for us to look into, for Finance Minister to see, what incentives are required to get this productivity. We should debate and see what best we can do to have this.”

To begin with is to consider the factors affecting productivity of the individual organisation. They are :-

1. Nature and quality of raw materials.
2. Basic nature of the processes employed.
3. Amount of plant and equipment employed-automation.
4. Efficiency of the plant and equipment employed.
5. Value, continuity and uniformity of production.
6. Utilisation of manpower.

Having identified the major factors influencing productivity, it is possible to formulate positive lines of action for improvement in productive efficiency. These can be summarised under the headings which have come to be known as “the six lines of attack.” They were first enunciated by Imperial Chemical Industries and have proved their value on the national scale as well as on the basis of individual firm :-

The key inputs being Capital, Material and Labour, productivity could be measured in terms of these inputs. In India where the relative scarcity of the factors of production is different, capital being the scarcest followed by raw material, in terms of their quality and cost. Volume of production i.e. capacity utilisation perhaps still occupies a paramount position in Indian paper industry especially in large paper mills. But volume of production is subject to many variables in the environment such as the market, price and infra-structural problems of power and transport. However, productivity in the sense of optimum achievement of put-put in relation to units of input can be pursued as an end in itself because in the process, other objectives such as production and profitability would be automatically taken care of. A higher productivity can ensure a durable base for both production and profitability. Therefore, higher productivity of all factors of production at various stages is essential.

In order to achieve higher productivity we must see that material and machinery input should be maintained at the highest possible level. While considering the improvement in the material productivity the important factors of Conservation of Raw Materials, Energy and Chemicals with minimum pollution load should be kept in mind.

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1. Improve basic processes by research and development.
 2. Provide more and improved physical means of producing.
 3. Simplify and improve the product and reduce the variety.
 4. Improve methods of operation.
 5. Improve organisation, planning & control.
 6. Increase man-power effectiveness at ALL levels.

Short-term—will require little or no capital.

Intermediate—may require capital

Long-term — will require capital

MATERIAL PRODUCTIVITY :

(a) RAW MATERIAL.

(i) Forest-

For Paper Industry raw material is cellulosic and this is a renewable resource. In India, due to heavy pressure of population, the land availability has become limited. The land is to be utilised for different end uses and for forest raw materials for paper every little land will be available. The only solution seems to be man made high density plantations and which must yield 50 tonnes of raw material per hectare per year, like Subabul etc. The introduction of Cold Soda Pulp from Subabul at Nepa mills has helped in improving the quality of newsprint and has also improved the machine performance, printability and overall economy.

(ii) Agricultural.

In the present situation mesta, bagasse etc. can be considered from agricultural sector for manufacture of paper, which has given encouraging results. It has been reported the establishment of integrated paper-cum-sugar-cum-chemical complexes with captive sugar cane plantations is quite viable. The above complexes should have common power, steam and water services and also boilers with thermal efficiency of more than 80% and back pressure turbines.

(iii) High Yield type of Pulping Processes.

Out of the available raw material high yield pulp should be produced and the target should be 90-50. It means 90% yield per tonne of wood and 50 brightness with reasonable strength properties to satisfy the triangle of yield, brightness and strength.

(b) ENERGY :

(i) Chemical Pulping :

Use of continuous digesters, close circuits for steam and vapours will reduce the steam requirement to 1 tonne/tonne of pulp as against 2T/tonne of pulp. It will send higher concentration of black liquor at high temperature thereby lessening the load on evaporators.

(ii) Blow Heat Recovery :

The vapour released at the time of blowing, its heat should be recovered with the help of blow heat recovery and water to this blow heat recovery should come from the surface condensers of evaporators and this heated water can be utilized in washing, screening and bleaching.

(iii) Lagging of Vessels, Tanks :

Digesters, black liquor storage tanks, seal tanks, blow tanks, green liquor tanks, white liquor tanks, dissolvers should be completely lagged so that black liquor sent for evaporating may have a minimum temperature of 80° c. The aim is to reduce steam requirement in the evaporators which would help in overall economy.

(iv) Brown Stock Washers :

The conventional rotary filter drums should be replaced by belt filter system which will save energy. In this system energy requirement is 14 KWH/T against 40 KWH/T. The washing losses are minimum and concentration of black liquor is reported to be very high and the dilution factor is reduced to 1 M 3/t against 2.5 M 3/t of pulp.

(v) Screens :

The open and gravity discharge screens should be replaced by high pressure high consistency screens, which will allow the use of back water and will cause reduction in water and energy consumption.

(vi) Centricleaners and Filters.

With small volume and less pressure drops having ceramic nozzle will require less energy. Again the conventional type of filters should be dispensed with and the displacement bleaching with the use of belt filters at the high Cy% be done, which will reduce the pumping and heat energy by 50%.

(vii) Conveying system :

Blowers be avoided, its power requirement is very high and they be substituted by belt conveyors wherever possible. For pumping high consistency material fluidized pumps should be used.

(viii) Refiners :

Conical refiners should be done away either with double disc or twin flow high consistency refiner of proper disc pattern which will reduce the energy requirement/tonne of pulp.

(ix) Steam and Power Generation.

On the energy front we must select boilers which will generate steam at maximum pressure and equipment should be so selected that they can operate on minimum pressure to ensure better economy.

(x) Caustic Chlorine Plant.

The mercury cells are out dated and the membrane cells should be introduced. There will be 30% reduction in energy consumption per tonne of caustic and as there will be no use of mercury, no pollution hazard will be there.

- (xi) For the process industry BP turbines is a must. Govt. should give incentive for such type of turbines. The use of thermo compression system, cascade system, for the use of flash steam, efficient condensate removal equipments, close hood, good ventilation and of trinit press, which will produce a sheet dryness of 40 to 44% after press. Use of indirect steaming system will reduce the steam consumption. 1% reduction moisture removal saves 4% of steam.

(c) PRODUCTIVITY IN CHEMICALS AND OTHER GENERAL CONSIDERATIONS :

Use of fluidised bed boiler and firing of the black liquor at 70% solids the use of falling film type of evaporators with vapour bleeding arrangements will economise the steam in evaporators and steam generation/tonne of solids will go up. With Indian woods the disulfidations and oxidation of black liquor is a must which will make the heat transfer efficient and increase the combustivity.

(ii) Anaerobic Effluent.

Effluent of high yield pulp will be easily biodegradable. It produces copious amount of methane which helps in generating power and added advantage is that it has got a fertilizer value.

All type of waste from effluent plant, like solids, gases and treated water should be put to use for production of paper, board, fertilizers irrigation, energy generation etc. so that not only it will meet its own cost but can bring some revenue.

(iii) More printing area.

The high yield pulp should be capable of producing lower GSM Paper. If against 52-53 gsm, we produce 48-49 gsm newsprint then 1000 more copies of 16 pages-newspaper per ton of Newsprint and thereby more number of customers will be served.

II. LABOUR PRODUCTIVITY :

It is very vital to India as we have got enormous human resources. We are mostly agricultural and feudalistic society. The transformation of such people into technical and scientific generation is an uphill task. Unfortunately, unlike other countries, the political revolution has come first and industrial revolution afterwards so people are more conscious about their rights rather than their duties.

During pre-independence era; there were private sectors only and foreign rulers were alien to nationalist thinking. Our trade unions had to fight the foreign rulers and big business magnates were pro-govt.

After independence they started engaging a socialistic and scientific society in publicsector. The nationalisation of industries were taken by the masses as governmentalisation of the industries. Hence the working classes has some alien attitude towards the govt. To improve the situation following steps are essential :

First and foremost, every man who is working, must have sense of belonging and to cultivate that, management should identify with smallest of the worker. Each and every worker should be recognised. They need not a be told that they are useless and surplus and redundant, as if unavoidable evils. On the other hand they should be treated as an asset, proper input is to

be given. They must be motivated. There must be continuous training programme at all levels till they retire.

The curricular should contain course of nationalism and patriotism. Their out-look should be scientific. Their quality of work life should be taken care of i.e. residential quarters, safety precautions, working conditions in the Plant. Their family welfare should be taken care of. They must be so oriented that they should take pride in their work. In no case man-power utilisation should be less than 5.5 man-hour work, out of 8 hours.

Some of the proven management techniques for improving the labour productivity are :—

- (i) Financial incentive schemes linked with productivity,
- (ii) Well organised training schemes to cover the employees at all levels both for implant and outside plant training.
- (iii) Well organised and dedicated small group activities like Quality Circle with involvement of both workers and supervisors.
- (iv) Active participation of labour in management through Shop Councils, Joint Councils etc.
- (v) Intensive efforts towards promotion of safe work practices. Introduction of scheme like SAHARA (Safety and Health and Accident Reduction Plan), Good house-keeping, creation of better work environment etc.

III. CAPITAL PRODUCTIVITY :

(a) Working Capital

In India where the capital is scarce it should be put to the best use. Hence productivity of both working capital as well as fixed capital must be improved. For improving the productivity of working capital, very tight control over inventories, cash flows, economic purchases, timely and quick despatches of the finished goods are some of the

measures. It will be interesting to mention that for production of one tonne of paper about 7 tonnes of bulk materials (including the finished product) are to be transported. Improving the productivity in transportation by a meticulous planning of the same will be positive step.

(b) Fixed Capital :

The greatest single major factor relevant to the paper industry in India, particularly for the large paper mills is the low capacity utilisation which is currently at 60% level, which has resulted in overall sickness of this industry. Needless to mention that this utilisation has got to improve to a level of atleast 80%. Timely modernisation and renovation of the plant and equipment is necessary for many large paper mills in India which have been in operation for the last many years. The major emphasis therefore, should be on modernisation and renovation of the existing units for better capacity utilisation rather than incurring heavy capital investment on new units.

Old plants and equipments which have worn out due to wear and tear not only results in low production but also higher costs on account of heavy losses of fibres, chemicals, energy and man-power.

Well planned maintenance, both preventive and predictive is necessary for improving the productivity of existing plant and equipment. The maintenance of building and civil structures also is equally important for their proper life and also to improve work environment.

IV. MEASUREMENT AND MONITORING OF PRODUCTIVITY :

Desired results cannot be achieved unless productivity in terms of the various resources used, is measured and monitored on continuous basis so that timely corrective action can be taken.

For paper industry, particularly for the large paper mills the productivity of key inputs like raw material and energy and chemicals (which contributes more than 65% of the total cost of production) must be measured and monitored on daily basis. In one of the newsprint mills in India this type of daily monitoring of technical

as well as financial performance has proved very beneficial.

For achieving higher productivity in Material, Capital and Labour and for its measurement and monitoring, well enlightened management with proper organisation is absolutely necessary. The management has to be progressive, making use of up-to-date and modern management techniques such as SOC, Computerisation, Value Analysis, Public Relations, After Sales Service, etc.

CONCLUSION :

It is often found that even a sick unit with efficient management can recover from its sickness and become

healthy unit and even a healthy unit can become sick if the management is not efficient. Therefore, with proper management inputs Indian Paper Industry can come out of the present situation and can not only recover from the sickness but also progress towards healthy economic survival. With all out efforts towards improving productivity and thus cutting down wastage in all its forms and working at highest efficiency we can confidently enter the 21st Century with a sense of achievement and pride.

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