

## India

### Mysore Paper Mills Modernization Project

Report Date: July, 2002  
Field Survey: August, 2001

#### 1. Project Profile and Japan's ODA Loan



Location map



Circulated fluidized bed boiler

##### 1.1. Background

In the late 1980's the demand for paper products in India had dramatically increased in accordance with socio-economic development. Nevertheless, the profitability and productivity of paper mills were decreasing rapidly because of the government's price controls on paper products, an increase in the production costs, and the deterioration of machines in general. Therefore, although paper production was expected to grow by 8% per year with the establishment of new mills, demand excess was expected to continue.

Mysore Paper Mills (MPM, the executing agency of the project) also suffered from low productivity because of deteriorating equipment. Moreover, it caused environmental problems as a result of slacked lime dumping and fly-ash (fine particulate ash carried into the air by the combustion of a solid fuel, such as coal) emissions in the vicinity of the mill, which had hazardous effects on the neighboring villagers. Under these conditions, modernization of the executing agency's mills was urgently required to address the problems of low productivity and environmental deterioration and, most of all, to contribute to a solution to India's paper production shortage.

##### 1.2. Objectives

To modernize existing paper machines, related facilities and utilities through replacement, rehabilitation and expanded installation, and thereby increase productivity and profitability, and reduce pollution.

### 1.3. Project Scope

- 1) Procurement and installation of facilities / equipment for:
  - a) Increase of the production capacity of paper machines;
  - b) Diversification and improvement of paper manufacture;
  - c) Improvement of the consumption norms for raw materials, power; and
  - d) Pollution control.
- 2) Consulting services

### 1.4. Borrower / Executing Agency

The President of India / The Mysore Paper Mills Ltd. (MPM)

### 1.5. Outline of Loan Agreement

Loan Amount / Loan Disbursed Amount	2,381 million yen / 2,374 million yen
Exchanges of Notes / Loan Agreement	October 1988 / December 1988
Terms and Conditions	
Interest Rate	2.5 % p.a.
Repayment Period (Grace Period)	30 years (10 years)
Procurement	General Untied
Final Disbursement Date	August 1999

## 2. Results and Evaluation

### 2.1. Relevance

At the time of appraisal, the Indian Government's policy regarding the paper industry was to protect domestic producers by imposing heavy duties on foreign products. In reality, however, the paper production of local producers was suppressed due to low profitability and distorted price regulation (administrative price mechanism, which sets upper limit on the paper product price). Consequently, paper mills throughout India suffered from low profitability. Therefore, the project to address the modernization of local paper mills was considered valid and relevant to the national policies.

The validity of the project purpose to increase productivity had, however, decreased during the course of its implementation because of industry deregulation. The Indian Government launched economic reforms in 1991, with trade liberalization so as to integrate Indian economy with the global economy for enhancing the economic growth in anticipation of economic reforms, the price controls on newsprint (executing agency's main product) were removed in 1989 (i.e. after the conclusion of the loan agreement), subjecting the prices of the product open for price competition in market mechanism. This change in the industrial policy of the Government of India could not be anticipated at the time of project appraisal. Furthermore, import duties on paper have been reduced, from 140% in 1991 to 65% in 1995, and further, down to 5%, at present.

Under the competitive market environment, the project's efforts not only to increase productivity and profitability at the paper mills, but also the conservation of power and its

reliable availability were still appreciated by the executing agency and Karnataka State Government. From the macroeconomic view, the official intervention of the State Government in this project for the benefit of one particular enterprise (although the project scope supported by ODA was narrowed to utility installment to improve the consumption norms for energy use) may not be recommended in the present changed economic scenario. However, in order to protect the environment from the industrial pollution, health of public (pollution affected) and conserve the scarce energy in State, it became important for State Government to step in to for mitigation of the industrial pollution and taking the measures for energy conservation.

## 2.2. Efficiency

### 2.2.1. Project Scope

#### 1) Scopes canceled or implemented by the executing agency's own funds

The scopes for Rehabilitation of Paper Mills and Pollution Control to Reduce fly-ash Emission was originally planned to be financed by Japan's ODA loan. However, these scopes were undertaken independently using the executing agency's own funds before the disbursement of the loan. This approach was adopted because the loan disbursement was postponed for two years due to a delay of the State Government's approval of this project, while an immediate improvement of production efficiency was needed in order to respond to the deregulation of the industry.

Diversification and Improvement of Paper Manufacture, Improvement of Consumption Norms for Raw Materials, and Pollution Control to Recycle Slacked Lime were not implemented. Although they were essential to meet the project objective, unexpected changes in the price policy and priorities of the executing agency had nullified the viability of each corresponding scope. Detailed reasons for the scope modifications are summarized below.

Table 1 Changes in the project scope

1) Scopes separately undertaken using the executing agency's own funds		
Scope and objectives	Equipment installed	Reason for separate implementation
Rehabilitation of paper mills I / II / III  To Increase the production capacity of the paper machines	- Thyristor control drives - Centri-cleaner - Stock preparation facility - Desk refinery - Suction coach roll - Size-press - Nip press (for paper mill No.3)	Realized that immediate action was necessary for an improvement of production efficiency in response to the abolishment of price controls and subsequent participation into free-market competition.  Undertaken during the years 1992 to 1994.
Pollution Control  To reduce fly-ash emission	- Electro-static Precipitator (ESP)	Installed along with the conversion of the old stoker fired boilers to FBC boilers during the year 1993 to 1994.

2) Deleted scopes		
Scope and objectives	Equipment to be installed	Reason for deletion
<p>Diversification and Improvement of Paper Manufacturing</p> <p>To produce more attractively priced gloss paper rather than officially price-suppressed newsprint</p>	- Super calendar	Found gloss paper unattractive to invest, due to competitive market and resulting small price difference with newsprint.
<p>Improvement of Consumption Norms for Raw Materials, Power, etc.</p> <p>To recycle imported used paper and benefit from low import duty on them</p>	- De-inking plant	Revealed that import duty on used paper had increased to 30%, from 5% at appraisal, and that demand for used paper was gearing up in North America, resulting in lack of financial viability.
<p>Pollution Control</p> <p>To recycle slacked lime through conversion to quick-lime</p>	- Lime kiln plant	<p>Found that collected slacked lime contained unexpected SiO<sub>2</sub>, which made it difficult to recycle.</p> <p>Possible to use slacked lime as neutralizer for the captive forestry plant.</p>

## 2) Scopes implemented by Japan's ODA loan

Only the work to improve energy-related consumption norms –a captive steam turbine generator (STG) and a circulated fluidized bed (CFB) boiler installment– was realized by the Japan's ODA loan, with some capacity volume expansion.

a) The power capacity of STG was augmented from 8 MW (with full required steam condensing) to 15 MW (with full required steam extraction) in response to an increased steam requirement due to the entire paper production expansion plan. The executing agency found it was economical to extract steam from STG for production processing. With the required steam extraction amount as a base, the capacity of STG was determined.

b) The fluidized bed combustion (FBC) boiler, with a capacity of 60 tons/hour, was also modified to a circulated fluidized bed (CFB) boiler with 90 tons/hour capacity. This alteration was made not only to cope with the increase in the steam requirement at the mills, but also to ensure less consumption of coal and less emission of SO<sub>2</sub> and NO<sub>x</sub>.

### 2.2.2. Implementation Schedule

Project implementation was substantially delayed, with the final disbursement date extended twice. The project was initially scheduled to be commissioned on April 1991, but was commissioned in June 1999. Major factors affecting progress were:

- Delay in project approval by the Karnataka State Government;

- Modifications in scopes due to drastic changes in the government policy regarding the paper production industry right after conclusion of the loan agreement;
- Delay in payment on local portion for the civil work contract due to insufficient funds at the executing agency; and
- Delay in the civil works by local contractor, due to unexpected downpour at the project site (Bhadravati district) and unexpected appearance of bedrock during the works.

The executing agency recognized that modification of the project scope had severely affected implementation progress.

### 2.2.3. Project Cost

Because of the lack of data, only the project cost for the ODA portion; installation of a captive steam turbine generator (STG) and a circulated fluidized bed (CFB) boiler, will be considered in this section. Due to the substantially changed scope of the project compared to the original, the total estimated cost of the project couldn't be compared with the actual cost of the project. However, as per the actual expenditure statement of the project, the total cost of the project is JPY 2,623 million as against original estimated cost of JPY 3,870 million.

As for the ODA loan, the amount of actual disbursement was about the same as estimated.

### 2.3. Effectiveness

The operation rate and its direct effects are evaluated only for the ODA loan portion. However, the discussion of effects of overall productivity of MPM naturally includes those of the project.

#### 2.3.1. Stable Energy Supply

One of the main objectives for the installation of the captive power plant was to stabilize energy supply, thereby reducing dependency on the existing grid, which had been frequently subject to power failure and load reduction (only load availability of 6 MW in the year 2000/01, against the normal load of 22 to 24 MW).

Table 2 Energy generation of the project generator and existing energy source

	Energy generation by the project STG (million kWh)	Energy generation by the existing STG (million kWh)	Energy Consumption from grid (million kWh)
1996/97	-	104.7	79.5
1997/98	-	132.3	80.2
1998/99	-	136.1	78.9
1999/00 – commission	65.2	86.0	70.4
2000/01	66.7	135.4	51.9
2001/02 (projection)	70.0	130.0	50.0

Source : MPM

As seen in Table 2 above, the project power generator (STG) contributes to a reduction of energy consumption from the unreliable existing grid. The project STG operates at 47-50% of

load factor. Since it started normal operation only two years ago (September 2001), the pre-existing generators still account for a large part of total energy requirement, operating at 62.3% of load factor in the year 2000/01. In the near future, the executing agency plans to increase operation rate of the newly installed STG to the same level as the pre-existing generators, further reducing dependency on the grid.

### 2.3.2. Energy Cost Saving

Another objective of the installation of this captive power plant was to supply energy cheaper than the existing grid line energy, and thereby reduce costs. A comparison of energy costs follows.

Table 3 Energy cost comparison (variable cost only)

	Existing STG		Grid supply	Project STG
	(Rs./kWh)			
	STG I	STG II	(Rs./kWh)	(Rs./kWh)
2000 / 01	2.57	2.59	4.08	0.85
2001 / 01 July	2.65	2.98	4.42	1.05

Source : MPM

As Table 3 clearly shows, the project STG produces energy at the least variable cost. Considering the difference with the grid energy cost, the project greatly contributes to production cost savings.

### 2.3.3. Cost Efficiency

The newly installed CFB boiler operates satisfactorily, with a higher utilization rate than the pre-existing FBC boilers.

Table 4 Utilization level of CFB boiler

	FBC I / II / III	CFB	Utilization factor	
	(60 TPH)	(90 TPH)	FBC	CFB
	Average daily generation (tons)	Average daily generation (tons)	(%)	(%)
1996 / 97	1,661	-	72.5	-
1997 / 98	1,300	-	65.8	-
1998 / 99	1,218	-	67.7	-
1999 / 00 commissioning	1,147	1,702	46.7	55.3
2000 / 01	1,172	1,897	56.1	62.0

Source : MPM

As a result of high utilization of CFB boiler, improved productivity is observed. The executing agency established some productivity indices for raw material and utility consumption during the paper manufacturing process. The effectiveness of adopting a cheaper energy source (STG) and more coal-use efficient boiler (CFB) is demonstrated below.

Table 5 Input consumption indices

Particulars	Unit	Before commission 1998/99	Commission year 1999/00	After commission 2000/01
Energy	Rs./Paper ton	6,993	6,030	5,281
Coal consumption	MT / Paper ton	1.92	1.80	1.76
Coal consumption	Rs./paper ton	4,504	4,456	4,898

Source : MPM

Note : "Paper" here includes both newsprint and other cultural papers

It is observed that the project STG greatly contributes to energy-efficient paper production, and that the CFB boiler uses coal more efficiently than the pre-existing FBC boilers. The executing agency reported that lower quality coal has been selectively allocated to the CFB boiler because of its better coal use efficiency, and therefore that more improved efficiency would be possible.

#### 2.3.4. More stable paper mill operation

More stable production (fewer mill operating shut-downs and less production loss) has been observed, owing to stable energy supply and increased availability of steam.

Table 6 Reduction of mill operating shut-downs and production losses

(Unit: hours per year)

Reduction of mill operating shut-downs				
	Paper mill 1	Paper mill 2	Paper mill 3	Paper mill 4
1996 / 97	216 ( 743)	297 (1,188)	133 (1,185)	203 (3,969)
1997 / 98	81 (1,460)	81 (1,589)	82 (1,244)	116 (2,110)
1998 / 99	61 ( 941)	71 (1,474)	75 (1,270)	75 (2,519)
1999 / 00	65 ( 935)	54 (1,206)	38 (1,097)	118 (2,298)
2000 / 01	56 ( 915)	47 (1,115)	67 (1,071)	97 ( 889)

(Unit : tons per year)

Reduction of production losses				
	Paper mill 1	Paper mill 2	Paper mill 3	Paper mill 4
1996 / 97	183.6	237.6	292.6	2,421.8
1997 / 98	68.9	64.8	180.4	1,327.0
1998 / 99	51.9	56.8	165.0	846.8
1999 / 00	55.3	43.2	83.6	1,371.2
2000 / 01	47.6	37.6	147.4	1,169.8

Source : MPM

Note : Figures in parentheses are interruption hours due to lack of energy.

The total mill operation shut-downs fell significantly in 1997/1998, as a result of converting the three existing stoker fired boilers into fluidized bed combustion (FBC) boilers. The figures of mill operating shut-downs has been maintained or further reduced in 1999/00 and 2000/01, though there were a few exceptions due to frequent mechanical and electrical maintenance during the early commissioning phase of project facilities. As a result, an apparent correlation is observed between the stable energy supply and curtailed paper production losses, as seen above.

### 2.3.5. Contribution to paper production

Table 7 below shows the volume of paper production at each mill in MPM. Despite the efforts to modernize the paper mills for the purpose of enhancing productivity and efficiency, no correlation has been observed as far as paper production volume is concerned. This is due to the fact that paper production has been driven more by the market (price and quality) than by the company's production plan or capacity in recent years.

Table 7 Volume of paper production

(Unit: tons per year)

	Paper mill 1, 2 & 3 (Cultural paper)	Paper mill 4 (Newsprint)
1994 / 95	24,080	88,370
1995 / 96	30,407	91,483
1996 / 97	29,960	50,840
1997 / 98	27,183	70,487
1998 / 99	27,373	65,134
1999 / 00	27,482	69,428
2000 / 01	29,188	87,578

Source : MPM

The share of the executing agency in newsprint product has been declining since the mid-1990s, as seen in the Table 8 below. The executing agency reported that imported products have taken a larger share of the domestic newsprint market every year, reducing the agency's own share. It is also reported that foreign products are more cost-attractive and of better quality, and sometimes dumped.

Table 8 Share in the national newsprint market

(Unit: thousand tons)

Year	Demand	Production	MPM Production	MPM Prod./ Demand	Gap	Import
1995/96	630	412	92	14.6%	218	347
1996/97	650	302	51	7.8%	348	494
1997/98	700	400	71	10.1%	300	540
1998/99	735	494	65	8.8%	241	426
1999/00 <sup>1)</sup>	803	488	69	8.6%	315	n.a

Source : India Infoline com presented by MPM

Note : <sup>1)</sup> Figures are projections, except for the executing agency's production.

### 2.3.6. Improvement in Pollution Control

Reduction of pollutant emissions was also envisaged at the time of appraisal. Among the items related to environmental improvement, installation of a lime kiln plant to recycle slacked lime and a de-inking plant to recycle used paper was canceled, as already explained. Only the installment of the CFB boiler to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions was implemented, along with the installment of ESP (Electro-static Precipitator) to the boilers, which was procured by the agency's own funds.

Table 9 Stack emissions improvement due to CFB boiler

	Existed FBCs		CFB	
	SO <sub>2</sub> (mg / M <sup>3</sup> )	NO <sub>x</sub> (mg/M <sup>3</sup> )	SO <sub>2</sub> (mg / M <sup>3</sup> )	NO <sub>x</sub> (mg/M <sup>3</sup> )
1994 / 95	3.91	3.44	-	-
1996 / 97	1.58	1.58	-	-
1998 / 99	1.55	1.58	-	-
1999 / 00	3.03	2.97	2.1	2.3
2000 / 01	3.10	2.85	2.3	2.1
Afterwards	2.0 - 4.0	1.8 - 4.2	2.0 - 4.0	1.8 - 4.2

Source : MPM

Note : Figures for SO<sub>2</sub> and NO<sub>x</sub> are the average of monthly monitoring data.

An considerable reduction of pollutant emissions in the year 1995/96 was achieved by converting stoker fired boilers into FBC boilers. Also, it is found that CFB boilers perform even better on SO<sub>2</sub> and NO<sub>x</sub> emissions than FBC boilers. According to the executing agency, no limits for these emissions are set by the Karnataka State Pollution Control Board.

### 2.3.7. Project FIRR re-calculation

A FIRR of 14% was calculated at the time of appraisal, assuming that the entire scope of the project would be covered by ODA loan. Thus, in the FIRR calculation, the financial benefits of the project were estimated based on an incremental paper production. The quantitative financial benefit of the scope financed by ODA loan (an installment of STG and CFB boiler), however, was reduced to energy cost savings only. Therefore, FIRR re-calculation is made by taking energy cost savings as a financial benefit.

FIRR of the installment of the STG and CFB boilers is calculated at 15.4 %, and judged to be a satisfactory figure. Satisfactory project performance in terms of FIRR is primarily explained by the large energy cost difference between the project STG and the conventional grid-supplied energy, as explained.

## 2.4. Impact

### 2.4.1. Social welfare improvement

The reduction of pollutant emissions in the neighboring communities has been observed and is considered an improvement in social welfare. The executing agency has, since its operation, developed an “employees town” in the surrounding communities, and continuously provided basic social infrastructures for its employees, such as housing, hospitals, schooling, and electricity and water services. According to the staff in charge of Social Service Provision at the company, however, no visible change in social service provisions can be attributed to the project. Under the shift to the competitive, market-oriented environment, it has become rather difficult for a state-owned company to increase budgetary allocation for such social services.

### 2.4.2. Environmental impacts

According to the executing agency, there have been no claims or actions protesting the project’s environmental impact from the neighboring local residents and surrounding population.

### 2.4.3. Transfer of technology applied by the project

With more fuel-efficient boiler and turbine generator installed by the project, awareness of fuel-efficiency has been raised among the executing agency's staff, particularly in the Power Block Division (which manages the utility facility in the mill). The Assistant General Manager of Power Block compiled presentation notes into a "Training Manual on Fuel Efficiency, Solid Fuels and Boiler Operation", and held a two-day training workshop periodically for the engineers concerned.

## 2.5. Sustainability

Evaluation regarding sustainability is made for the Japan's ODA portion only, except for the section on financial status (2.5.3), due to insufficient data.

### 2.5.1. Operations and Maintenance

Operation and Maintenance (O&M) for the newly installed energy / steam generation facilities has been undertaken by the Power Block Division of MPM Bhadravathi Works. The Power Block Division was established as O&M body to manage all of the executing agency's steam generation boilers and steam turbine generators. The Assistant General Manager of the Power Block Division reports to the General Manager of Production, who supervises the entire paper mill operation. The organizational chart is shown below.

Both operation and maintenance of the equipment (particularly electrical equipment) used by the project boiler and turbine generator have been carried out well, in accordance with the O&M manual provided by each supplier or manufacturer. Operation of the project facilities has been performed satisfactorily, as explained in the section "Effectiveness" (2.3).

The Power Block Division has adopted a daily preventive maintenance system, which places a high priority on lubrication and bearings for the electrical equipment and metallic parts.

The Power Block Division has also undertaken an annual overhaul during the planned shut-down period, in close cooperation with the Head Maintenance Division. The Head Maintenance Division provides additional overhaul staff for the scheduled overhaul. The shut-down normally lasts two weeks. Priority during the annual overhaul is given to checking the condition of the cable and gasket connections.

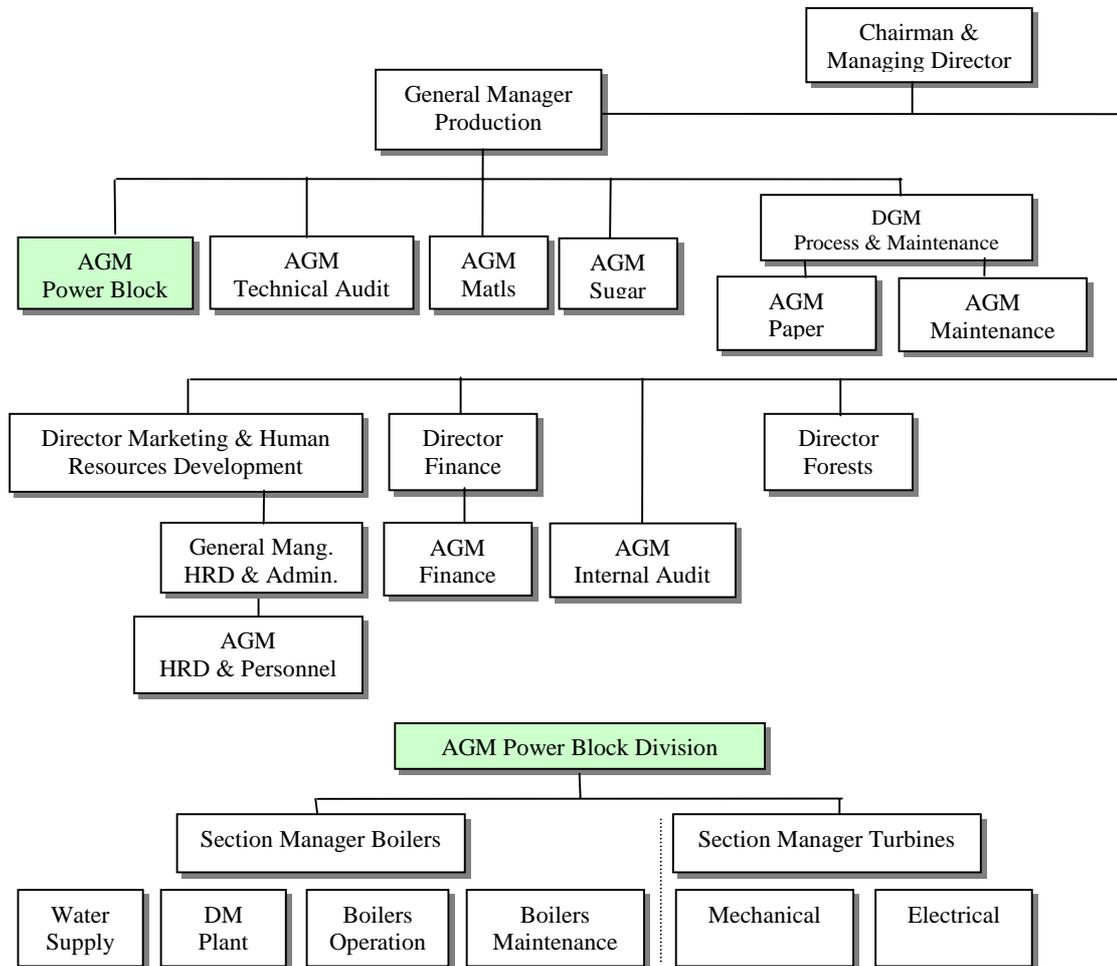


Figure 1 O&M body and organization chart  
 Note : AGM stands for Assistant General Manager.

The executing agency has partially computerized the stock management system and refers to suppliers or to the manufacturer’s manual when stocking spare parts.

It is also noted that the executing agency has been certified for ISO 14001, known as the Environmental Management System, and has been continuously motivated to seek ways to make the operation of the mills more environmentally friendly. It also works to keep closer communication with the surrounding community.

**2.5.2. Technical Capacity**

O&M staff for the project facility (staff in Power Block Division) total 214 people, 19 of whom are managerial level staff (August 2001). The executing agency has a Human Resource Development Division (HRDD), which offers a series of training programs for mechanical and electrical engineers, including on-the-job training. According to the Power Block Division, there have not been any problems or issues caused by the technical capacity and skills of the O&M staff.

### 2.5.3. Financial Status

Financial performance of the executing agency to date has been satisfactory. Implementing the project may have helped improve the financial soundness of the executing agency, even as it has faced an increasingly competitive market.

Table 10 Financial performance of the executing agency

(Unit : Rs. million)

Year	1996/97	1997/98	1998/99	1999/00	2000/01
Income	2,846.2	3,016.5	3,171.1	3,701.7	4,148.0
Expenditure	2,823.1	3,013.4	3,159.4	3,685.0	4,068.3
Net profit	23.1	3.1	11.7	16.7	79.7
Accumulated reserve	377.5	377.0	385.1	397.4	440.4

Source : MPM

However, prospects for the financial sustainability of the executing agency are not good, for the following reasons:

- 1) The market for newsprint (the most important product of the executing agency) is very competitive.<sup>1</sup> Overseas exporters pay relatively low custom duties (now 5%), and there has been a heavy inflow of cheap, imported newsprint.
- 2) The market for cultural paper (writing, printing, and wrapping paper) has been competitive domestically. Prices are subject to market fluctuation.

In response to the shift to a more competitive market, the executing agency has intensively adopted cost reduction measures, including this project (which brought about reductions in energy and coal fuel costs) and a captive forestry project (for securing its own source of pulp material). In addition, it has been provided with a Rehabilitation Package<sup>2</sup> by Karnataka State Government; i) Sales tax (ST) exemption on finished product, which was around Rs. 10 crore<sup>3</sup> per annum, ii) Exemption of royalty and ST on raw materials procured from State Government agencies, which was around Rs.6 crore per annum, and iii) ST exemption on captive power generation, which was around Rs.1 crore per annum. The package has expired on March 2002, but MPM has again taken up the matter with Karnataka State Government for extension of the same 3 years i.e. till 2005.

As of August 2001, the executing agency has not faced difficulty in financing its operation, partly thanks to such programs. However, the Rehabilitation Package is scheduled to end in March 2002, and the executing agency has admitted that internal cash inflow is not sufficient to proceed with further capital investment and rehabilitation.

To sustain the operation of the paper mills, the executing agency has recognized the need for further reduction in cost of production. The following cost reduction measures have been initiated by MPM;

<sup>1</sup> Some improvement in the newsprint market in favor of the executing agency was seen in the year 2000/01, represented by the upward shift of domestic prices and, consequently, increased sales. However, the Government of India has not yet reacted in favor of the domestic newsprint industry by imposing an anti-dumping duty.

<sup>2</sup> The Rehabilitation Package has been made available to state enterprises in India that were formerly subject to government price control for their products (known as Administrative Price Mechanism), for the purpose of ensuring financial revival.

<sup>3</sup> Crore=Ten Million

i) MPM has negotiated with the supplier of chemicals to bring down their prices. The reduction in the prices of chemicals along with usage of the same has been reduced by Rs.460.00 per tonne. ii) Steps were initiated to improve the steam to coal ratio to 5.44. The cost of captive power generation was also reduced because of the improvement in the steam to coal ratio. Efforts were also made to reduce the usage of steam and power. The above measures have resulted in cost of production by Rs.729/-per MT. iii) The imported pulp requirement for Newsprint was reduced from 17.9% to 13.2% due to the increased supply of captive pulpwood. The pulp usage for newsprint was also required from 0.915 MT to 0.900 MT per tonne of Newsprint. This measure has resulted in cost of production by Rs.1852/-per MT. iv) The result of all the above cost reduction measures is in the order of Rs.22 crore on a production of 75,000 MT of Newsprint per annum.

### **3. Lessons Learned**

When assisting state enterprises, careful attention should be paid to industrial policy changes, and the coverage of assistance should be limited to the area overreaching the corresponding policy supports, in order to ensure the validity of ODA.

Also flexible modification of project scope during project implementation is essential to keep pace with changes in the project environment.

### Comparison of Original and Actual Scope

Item	Original Plan	Actual
<b>Project Scopes</b>		
1. Procurement and installation of the facilities and equipment		
a) Increase of the production capacity of the paper machines (Rehabilitation of paper mills I, II, and III)	<ul style="list-style-type: none"> <li>- Thyristor control drives</li> <li>- Centri-cleaner</li> <li>- Stock preparation facility</li> <li>- Desk refinery</li> <li>- Suction coach roll</li> <li>- Size-press</li> <li>- Nip press (III)</li> </ul>	As planned (separately procured by the agency's own fund)
b) Diversification and improvement of the paper manufactures	<ul style="list-style-type: none"> <li>- Super calendar</li> </ul>	
c) Improvement of the consumption norms for raw materials, power and so forth	<ul style="list-style-type: none"> <li>- De-inking plant</li> <li>- Steam turbine generator (STG:8MW)</li> </ul>	Canceled Modified to 15MW
d) Pollution control	<ul style="list-style-type: none"> <li>- FBC boiler (60t/d)</li> <li>- Electro-static precipitator (ESP)</li> </ul>	Modified to CFB (90t/d) As planned (separately procured by the agency's own fund)
2. Consulting services	<ul style="list-style-type: none"> <li>- Lime kiln plant</li> </ul>	Canceled
a) Foreign Consultant	<p>In the areas of FBC, STG, ESP, thyristor drive, lime kiln plant and de-inking plant</p> <ul style="list-style-type: none"> <li>- Preparation of basic design and process drawing</li> <li>- Preparation of all the tender documents</li> <li>- Assistance in evaluation of the tenders</li> <li>- Technology transfer</li> </ul>	<p>Areas revised including boiler, generator, bagasse pulp plant, rotary lime kiln</p> <p>For the above areas</p> <p>For boiler and generator</p> <p>For boiler and generator</p>
b) Local Consultant	<p>In the areas except for the above mentioned</p> <ul style="list-style-type: none"> <li>- Preparation of all the tender documents</li> <li>- Assistance in evaluation of the tenders</li> </ul>	<p>For civil works</p> <p>For civil works</p>
<b>Implementation Schedule</b>		
(1) Loan Agreement	Nov. 1988	Dec. 1988
(2) Selection of Consultant	Jun. 1988 - Oct. 1988	Aug. 1990 – Apr. 1992
(3) Basic Design	Jun. 1988 - Dec. 1988	Dec. 1992 – Nov. 1993
(4) Selection of Supplier	Nov. 1988 - Aug. 1989	May. 1995 – Aug. 1996
(4) Procurement	Nov. 1988 - Nov. 1990	Aug. 1996 – Aug. 1998
(5) Civil Works and Installation	Jun. 1989 - Feb. 1991	Oct. 1996 - Feb. 1999
(6) Commissioning	Apr. 1991	Jun. 1999

<b>Project Cost</b>		
Foreign Currency	2,381 million yen	2,374 million yen
Local Currency	1,489 million yen	249 million yen
Total	3,870 million yen	2,623 million yen
ODA Loan Portion	2,381 million yen	2,374 million yen
Exchange Rate	Rs.1 = 9.8 yen (Apr.1988)	Rs.1 = 2.8 yen (Average during 1996 to 2000)

**Independent Evaluator's Opinion on  
the Mysore Paper Mills (MPM) Modernization Project**

**M.C. Gupta**

Indian Institute of Public Administration

1. The scope of the project envisaged increased productivity through modernization, rehabilitation and diversification (which was abandoned during the course of implementation). Some of the projected components originally envisaged for rehabilitation of paper mill and combating pollution were undertaken independently by the executing agency. The project objectives have relevance to national development goals and direction, which envisages better performance of the state owned enterprises through improvement in efficiency of productive assets and optimum utilization resources.
2. The project, though initially planned for commissioning in 1991 was finally commissioned in 1999 because of delay in project-approval by the State Government and modification of the scope of the project.
3. It is sure that the project had a positive impact in stabilizing energy supply, reducing dependence on the existing grid and stable mill operation increasing output, lowering production cost and improving profitability besides generating environmental benefits.
4. For the purpose of sustainable impact realization, executing agency has the potential to operate at higher plant load factor thereby increasing capacity utilization rate. This would meet the requirements for enhanced paper production at reduced costs due to a higher captive generation and also improved productivity. It is worth noting, however, that the withdrawal of Rehabilitation Package in the form of waiver of interest, tax and dividend exemption by the end of March 2002 would leave MPM with inadequate funds for further capital formation, maintenance and operation, as indicated in the evaluation report.
5. It should be also noted that a shift to more competitive market on account of globalization and changes in national development policies may affect sustainability of the mills operation. Therefore, continuing efforts towards improvement in production efficiency and cost reduction in MPM would be the key areas for the long-term sustenance. Well-focused assistance and cooperation through the external agencies for diversification, automation and fly-ash utilization may help in this regard.
6. The Evaluation report is comprehensive and incisive. Addressing some perceptions of the senior management of the executing agency on the future performance would have been also valuable.

JBIC Comment

The delay in project-approval by the State Government was that approval on series of modification of the scope of the project delayed.