

Indian Paper Industry and Human Resource Development

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ABSTRACT

The performance of the Indian Paper Industry has not been very satisfactory so far with rather low capacity utilization, higher energy and water consumption, high chemical consumption and heavy pollution load. The issues of shortage of fibrous raw materials, obsolete technology, environmental awareness and new economic policies with globalization are going to influence the industry greatly. The present paper analyses the performance of the Indian paper industry and current pattern of utilization of human resource and HRD institutions. The persons with high school and below qualifications constitute over 75% of task force in the industry while production and maintenance related function engage over 75% of human resource. The HRD institutions on the other hand are poorly funded and have little industry interaction. Except perhaps IPT, most institutions do not involve in continuing education programmes in the area of Pulp and Paper Technology.

The future man power needs will have to be planned in relation to the changes taking place. The manpower training needs exist at both at fresh entry level as well as at continuing education level for working personnel. The paper makes an analysis of future man power needs based on emerging trends and suggests a model for achieving the targets which will make paper industry in India truly competitive.

Introduction

Indian paper Industry has made rapid strides since 1812 when the first factory was organized at Serampore. From 45,000 tonnes per annum in 1930, the installed capacity has risen to over 3.7 million tonnes per annum in paper and newsprint sectors today. The industry has very wide base with plants of varying sizes and ages using diverse raw materials and processes, producing wide variety of papers and boards.

Pulp and Paper industry constitutes one of the most important sectors of India's industrial economy and is listed as one of the 17 basic industries in the industrial policy resolution of 1948.

Current Status of the Industry—Issues and Challenges.

The Indian paper industry grew in terms of capacity and number from units 1950 to today. But the capacity utilization has decreased from a peak 99% in 1970-71 to slightly less than 60% currently. During the decade 1980-81 to 1990-91 the rate of growth of number units was 9.4%, installed capacity of 7% while production rose by 6.6%.

Prior to 1970 forest based bamboo and wood were the main materials for paper making. Mills which came up after 1970 were mostly small in size and are using agricultural residues and waste paper. The installed capacity and number of units engaged in pulp and paper production are shown in Table-1.

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Table—1
Installed Capacity of Pulp and Paper Industry in India
(As on 1-1-1993)

Type	Number	Installed Capacity Million Tonnes per Annum
Newsprint Mills	7	0 353
Rayon Grade Pulp Mills	5	0 196
Market pulp mills	1	0 040
Paper and Board Mills	340	3 550

The capacity utilization of paper and board mills is 59.9% while it is over 90% for newsprint mills. Nearly 134 units in paper and board category with an installed capacity of 0.866 million tonnes is closed. The capacity utilization of the working paper and board mills is 79.2% (62% for waste paper based units, 78% for agro based units and 95% for forest based units).

There are 310 working units of hand made paper units under KVIC in 1989-90 producing 7000 tonnes per annum paper and board valued as Rs. 72.4 millions. This sector has an employment potential of 5300 persons.

The import of paper and board has been about 0.02 million tonnes a year while newsprint import has been about 0.222 million tonnes a year.

The demand forecast for paper and board industry has been projected as under.

Table—2
Demand Projection
(Million Tonnes/Year)

Year	Paper and Board	Newsprint
1995-96	27	6.7
2000	35	7.8
2005	45	8.8
2010	53	10.0

The average capacity utilization in Paper and Board sector is likely to be 80% while it is likely to be over 90% for newsprint sector. Additional capacity may be necessary for meeting the export commitment.

The Indian paper industry has been confronting many challenges which include fibrous raw material shortages, obsolete technology, energy shortages and environmental pollution. The new economic policies coupled with liberalized open door industrial policy globalization have added the dimension of international competition in domestic markets. Removal of protections and controls have led to new realities of competitiveness of quality and prices. These challenges will lead to changes in the order of things like :

increased automation, instrumentation, computerization and micro processor based controls.

increased productivity

increased machine speeds

increased stress on environmental management

improved product quality

greater exports

Joint ventures in Indian abroad with tieups.

trading by international companies in India and through India.

Human resource in India is one other finest and it can become a major strike weapon in globalization of paper industry. Indian manpower will find its own level in terms of wages and job opportunities in international paper markets. The impact of this is already being felt in the Indian industry in terms of greater mobility of manpower. The growth in auxiliary sectors like machinery manufacture, wires and felts, design and consultancy, planning and erection, teaching and research will also experience the impact of globalization.

Performance Norms

The performance of the Indian Paper Industry is far from satisfactory. To get its true picture, a survey

TABLE—3
Norms of Performance of Indian Paper Industry— 1992 Operational Parameters.

Detail	Unit	Large Integrated* :		Small Agro	
		Range	(Av)	Range	(Av)
Raw Material	T/T	1.48-3.5	—	2-25-5.5	—
Caustic Soda	kg/T	13.4-131	55.8	124-250	187.9
Salt Cake	kg/T	20-72	42.6	—	—
Lime	kg/T	200-615	339.1	56-530	213.6
Chlorine	kg/T	20-156	68.9	85-262	145.5
Alum	kg/T	35-153	66.9	45-135	65.8
Rosin	kg/T	7-12	9.6	2.5-17	8.8
Water	mi/T	161-400	277.8	90-392	208.5
Steam	T/T	6.4-20.5	10.1	3.3-7	5.8
Power	kwh/T	1193-2311	1579	841-2649	1287
Generated Power/Total Power	%	26.6-71.4	47.4	9.1-66.7	—

* Includes 2 newsprint mills.

TABLE—4
Norms of Performance of Indian Paper Industry—Economic, Labour/Manpower Parameters

Detail	Unit	Large Integrated :		Small Agro	
		Range	(Av)	Range	(Av)
Capacity Utilization	%	73-132.9	99.7	56.7-137.4	—
Capital Intensity					
—Capital Intensity					
—GFA*/output	Rs./T	6467-37800	19387	5739-32260	12376
—Sales/GFA	Rs./Rs.	0.49-2.99	1.08	0.65-2.02	1.57
Capital Productivity					
—GFA/Regular Employee	Rs. Lakh/Reg. Empl	1.46-10.2	5.4	1.99-9.94	3.07
—GFA/Total Employee	Rs. Lakh/Total Empl.	1.19-7.36	3.94	1.84-6.45	2.43
Labour Productivity					
—Output/Reg Empl.	TPA/Reg Empl.	16.8-53.6	26.8	12.97-60.43	24.77
—Output/Total Employee	TPA/Total Empl.	11.3-33.2	19.2	7.39-35.76	18.69
Sale Productivity					
—Sales/Reg. Empl.	Rs. Lakh/Reg. Empl.	3.05-8.6	5.21	2.33-8.09	4.81
—Sales/Total Empl.	Lacs/Total Empl.	1.97-6.11	3.73	2.75-4.88	3.89
Manpower Usage					
—Reg Empl/1000TPA	Reg. Empl/1000TPA	18.7-59.7	37.3	16.54-77.10	40.4
—Total Empl/1000 TPA	Total Empl/1000 TPA	30.2-88.5	52.1	26.9-135.4	53.5
—Reg. Empl/Total Empl.	%	61.8-81.7	72.6	58.9-94.7	82.2

* Gross Fixed Assets

TABLE-5
Performance Norms of India Paper Industry—1992 Other Parameters

Parameter	Unit	Large/Integrated mills.	Small Agro mills.
Raw material Storage on equivalent basis	Month of consumption	0.87- 5.33 (av 2.19)	1.8-13.74 (av 5.59)
No. of Digester/100 TPD	No. (av)	3.55	18.3
No. of Paper M/c. /100 TPD	No. (Av)	2.03	4.53
Waste Paper as furnish	%	0-34.1 (av 4.85)	0-42.19 (av 11.23)
Purchased pulp as furnish	%	0-33 (av 6.93)	0-70.7 (av 7.50)
(Waste Paper + Purchased pulp) as furnish	%	0-42.76 (av 11.78)	0-70.7 (av 18.73)
Primary E.T*	%	100	100
Secondary E.T	%	90	77
No. of Units having HRD section	No.	9	3
In house R&D facilities exist.	%	90	20
		100	46

*E.T—Effluent Treatment.

The economic and labour/manpower parameters indicate wide variations among Indian mills. The difference between large and small agro mills has practically nil.

TABLE-6
Contents of this table is given on next page

TABLE-7
Level wise Distribution of Manpower

Detail	Large Integrated Mills : Small Agro Mills					
	Higher :	Middle :	Skilled / unskilled : in all	Higher ;	Middle :	skilled/Unskilled in all
Production	0.54	3.29	87.22	0.68	4.49	77.9
R & D	0.10	0.36	in all	0.13	1.50	in all
Other Tech* functions	0.75	4.09		1.08	5.04	
Non Tech**	0.52	3.22		2.01	7.15	
Total	1.80	10.96	97.22	3.90	18.20	77.90

*Includes materials and stores, maintenance, utilities and services.

** Includes sales, purchase, finance, accounts, administration and personnel.

was conducted in which 10 large integrated mills (including 2—news print mills) and 13—agro based mills participated. Based on the response the performance norms are evaluated. The mills surveyed had a total installed capacity of 0.923 million tonnes in 1992.

The average unit size of Indian Paper Industry is small (about 30 TPD). The level of technology is low. The raw material base is weak. The units are essentially multimachine and multiproduct type. The units so far have been functioning under an umbrella of protections, fiscal benefits, controls and essentially under a sellers market. All these are changing.

The performance of the Indian industry is shown under the following :

- operational parameters (table-3)
- economic, labour/manpower parameters (table-4)
- other parameters (table-5)

The other parameters show the use of large number of digesters in cooking, large number of paper machines and large raw material storage.

The industry investments in research and development is poor. While the research and development expenditure of all industries in India is 0.7% of annual sales turnover, the research and development investment in chemical industry is 0.9% of annual sales turnover and that for paper industry is typically 0.03–0.05% of total annual sales turnover. This is very low.

The operational parameters indicate wide variations in the performance norms among Indian paper mills. These figures are, in most cases higher than those being attained by mills in advanced countries indicating the potential for improvements.

Current Pattern of utilization of human resources in paper industry :

The regular and total employees for 1000 tonnes annual production for large integrated mills is 37.3 and 52.1 persons respectively. The corresponding

figures for small agro paper mills are 40.4 and 53.5. Regular employees are those on company pay rolls. Total employees include contractual and casual labour in addition to regular employees. The contractual daily wage persons to regular employees in large integrated mills and in small agro mills are 0.377:1 and 0.216:1 respectively.

The sectoral distribution of Man power is shown in Table—6.

Table—6
Sectoral Distribution of manpower

Sector	Large Integrated Mills %	Small Agro Mills %
Production	35.57	54.34
R&D	0.76	11.07
Marketing/Purchase	9.79	
finance, Corporate office		
Other*	43.86	25.83
Forest & raw material	10.02	8.76
Total	100	100

* Largest proportion is an Service/Utilities and Maintenance sectors.

The qualification wise distribution of manpower in Indian Industry is shown in Table—8.

The technical man power (9.13% in large integrated mills and 10.61% in small agro mills) is further analysed in the areas of pulp and paper technology, chemical engineering, mechanical engineering, electrical and Instrumentation engineering and others. This distribution is shown in Table—9.

The occupation wise distribution of manpower is shown below.

The current utilization patterns of Human Resource indicate the following :

- Largest percentage (over 75%) of manpower is utilized in production and service related functions.

- R&D and Human Resource development functions are neglected in the paper mills.
- The Commercial Functions (other than raw material procurement) account for 9-10% of manpower.
- The unskilled/skilled manpower represents over 75% of human resource of paper mills.
- Qualification wise the technical manpower is only 9.1% in large mills while it is 10.6% in small agro mills.
- Persons with qualifications of high school or below constitute over 75% of total manpower.
- In the technical manpower, persons with mechanical engineering background represent highest proportion (over 47% of technical manpower). The next highest is electrical and instrumentation personnel (over 28% of technical manpower).
- Pulp and Paper background personnel are only about 10.5% of technical manpower (1% of total manpower). Chemical engineering background personnel are even smaller.
- Persons with engineering degree or above are only about 2.2% of total manpower.

Table—10
Occupation pattern wise distribution of manpower in
Indian paper industry
%

Detail	Large Integrated Mills	Small Agro Mills
Professional, Technical and Related	18.81	21.64
Administration, Executive	6.22	5.13
Service workers	21.27	9.97
Production & related workers.	44.79	48.55
Clerical and related.	8.91	14.71
Total	100	100

The international scene in paper industry suggests mills of large size with state of art technology. The concepts will be fast machines, single product, high energy efficiency with environmentally friendly process technology. The industry will be highly automatic with computer controls, microprocessor based process instrumentation and controls. The man power usage will be rather small, but will be highly knowledgeable and skilled. This is already evident from the developments in India's immediate neighborhood (like in Indonesia, Malaysia and Thailand). All these changes will make Indian paper industry to plan for changes in all its activities including in human resource management.

HRD institution catering exclusively to pulp and paper industry :

The educational facilities in the areas of pulp and paper technology can be analyzed in terms of courses available, seats available, staff position, infrastructural facilities, industry interaction, job opportunities for the students, financial budget etc. The HRD institutions can essentially be categorized as under.

- Those offering bachelor of engineering/technology degree courses (4 years after +2 or 3 years after B.Sc.) and other higher courses in pulp and paper technology. The Institute of Paper Technology, (IPT) Saharanpur (University of Roorkee) falls in their category. LIT Nagpur offers degree courses in cellulose technology.
- Institutions offering post graduate diploma programmes in pulp & paper technology after B.Sc./B.E. These are 1 or 2 year programmes. The University diploma programme at IPT is a 2 year programme equivalent to M.Sc. while the one at FRI Dehradun is one year diploma programmes. Indian Institute of packaging offers a diploma programme in Packaging.
- There are a number of polytechnic (like at Bhadravati, Thriruchirapalli, Yamunanagar) offering 3 years polytechnic diploma after +10 level in Pulp and Paper Technology/Chemical Engineering.

- There are some institutions (like at Bangur nagar) offering 3/4 years Bachelor of Science/applied science programmes after +2 level.
- There are some institutions offering other programmes like the Hand Made paper institute at Pune.
- Institute of Paper Technology at Saharanpur is the only Institute run exclusively for the paper industry. Besides B E. and U. Diploma programmes it offers master of engineering course and Ph. D. programmes in pulp and paper. The programmes at IPT are fairly well formulated. The multidisciplinary faculty is qualified and trained for preparing human resource for paper industry at first entry level. The industry interaction in this Institution is fairly good.

The HRD institutions suffer from lack of adequate funding, poor/provisions, in adequate infrastructure, the teaching/training curriculum's in sensitivity to industry needs, lack of plans/funds for faculty upgradation. Some of the programmes do not fit into any well accepted pattern.

The industry academic interactions are weak. The industry so far has kept it self rather aloof from the HRD institutions except perhaps for a few forward looking industrial houses. There is a need for greater commitment from industry both to HRD and HRD institutions associated with teaching and training in pulp and paper technology. This commitment can be in many ways like formal financial assistance for specific programmes, help institutional faculty in upgradation, help on infrastructure development, association in developing appropriate curricula, provide the motivation for students in form of paid training facilities, scholarships; prizes etc. The Institute of paper Technology at Saharanpur and one or two other institutions are better off interms of good industry interactions.

HRD institutions so far are involved in training/teaching first entry level personnel to take up shop floor supervisory/graduate engineer jobs mostly in production/process/technology areas. There are practically no programmes for operator skill development.

Similarly there are no programmes for Electrical/Machanical engineers or even B. Sc./M. Sc. in the areas of pulp and paper technology. Short duration courses for such personnel are needed. Most HRD institutions are not involved (except perhaps IPT. Saharanpur) in conducting industry specific short term continuing education programmes.

Most of the HRD institutions have so far not been able to convince the industry that they are capable of training the manpower for paper industry quite effectively. The institutions should plan strategies for increased industry interaction and ensure transfer of shop floor practical knowledge into the class rooms.

The major problems in paper industry relate to high manufacturing cost, poor skill levels, low productivity, obsolete technology and increased environmental pressures. The issues of globalization require modernization of both mills and men. Technological obsolescence has to be fought with competent, skilled manpower. The industry must develop plans of creating the man power by being an active partner in training first entry level personnel on one hand and itself being involved in in house HRD activity to upgrade existing mill personnel,

The future Manpower needs of Indian Paper Industry :

The manpower needs are assed on the following basis.

- Increased productivity of manpower will be attempted through modernization and automation.
- Greater will be the manpower needs in sectors like raw materials management, energy and environment management, marketing and globalization, HRD and R&D activities.
- Additional manpower will be needed for new greenfield and expanded units, retiring manpower components, and for globalization of Indian human resource.
- Man power will be needed for continuing educational needs at various levels and for auxiliary sectors.

— The future manpower distribution will be at four levels namely (i) Skilled shop floor operational and maintenance personnel (ii) Middle level supervisory personnel (diploma) (iii) Degree level engineers and professionals for production engineering and managerial functions (iv) Personnel for R & D, design/development/trouble Shooting. HRD activities, consultancy etc. The requirements for teaching and training both at first entry level and for continuing education will be different.

The HRD required at continuing education stage and at fresh entry level are summarized in table—11.

The emerging trends in human resource utilization in Indian mills will be briefly as under :

— Emergence of integrated production and maintenance functions replacing current compartmentalized practice. This will call for greater knowledge/skill for personnel in process/utilities/maintenance related functions. Multitrade skills and knowledge will be necessary.

TABLE—8
Qualification Wise Distribution of man Power in Indian Paper Industry (in %)

Detail	Large/Integrated Mills	Small Agro Mills
Technical	9.13	10.61
— Degree	2.28	2.46
— Diploma	3.04	2.63
— I T I	1.67	2.56
— Skilled	2.15	2.97
Science	4.86	4.72
Arts/Commerce/others	5.81	6.59
Management	1.40	1.26
High School and below	78.80	76.81
— High School	28.19	30.35
— Below High school	50.6	46.46
Total	100	100

TABLE—9
Break UP of Technical Manpower in Indian Paper Industry (%)

Specialization	Large/Integrated Mills :			Small Agro Mills		
	Degree :	Diploma :	ITI + skilled	Degree :	Diploma :	ITI + skilled
Pulp and Paper	0.229	0.623	0.111	0.56	0.54	0.25
Chemical Engg.	0.423	0.022	0.000	0.29	0.01	—
Mechanical Engg.	0.913	1.371	2.124	0.70	1.11	3.22
Electrical Engg*	0.500	0.649	1.486	0.43	0.67	1.99
Others	0.221	0.367	0.963	0.43	0.23	0.16
Total	2.276	3.039	3.818	2.46	2.63	5.53

*Includes Instrumentation.

TABLE—11
Continuing Education for Existing Mills and for new Capacity (Green field/expanded.)

Level	Details of Training
Worker/Operator	Skill development in operational/Maintenance functions at plant level. Tasks—identification of training modules, training modules preparation, trainer development. Most difficult due to large numbers involved, language/communication, trainer shortages.
Supervisory	Knowledge and skill development at plant/institutional level operational/maintenance functions with—quality/cost/productivity emphasis. Tasks—identification of training modules, preparation of training packages, development of trainers.
Middle/Junior Manager/Engineer	Knowledge development with some exposure to skills. Inputs relating to equipment design, technology commercial aspects. Programmes at plant/institutional level. Tasks—identification and preparation of training packages. Need high communication level.
Non Technical Managers/ Executives	Knowledge development in Pulp and Paper Technology and Correlation of non-technical aspects to manufacturing and productivity. Short duration programmes at metro politan centers/HRD institutions/mills/corporate offices. Need high communication level.
Senior level.	Short duration state of art/knowledge exposure for stimulating ideas. These brain storming sessions can be conducted with high order of communication skills in corporate offices/Metropolitan cities on specific subjects.

TABLE—12
Training Needs at HRD Institution for Fresh Entry Level

Level	Nature of Training
Pulp and Paper specialists	Complete training at Post Graduate Degree Engineers. Degree Engineers, University Diploma/M.Sc. (P&P), Polytechnic Diploma holders ITI's/or Certificate holders with skills. Need—Proper course formulation, standardization of programmes practical inputs, greater industry association, infrastructure.
Mechanical/Chemical/ Electrical/Instrument- ation specialists	Orientation training of people in Degree/Diploma/ITI level in pulp and paper technology short duration 6 weeks to 6 months programmes in associations with specific mills/Paper mills Associations.
Fresh B Sc /M.Sc.	Short duration orientation in Pulp and paper technology 3—6 months and in the type sponsored programmes.
B A./B.Com /M.A./ Management special- lists	Short orientation programme on basic pulp and paper manufacture and correlation to commercial/non technical activities 1—2 weeks duration at HRD institutions/mills sites.
Operators (Skilled)	Orientation to Pulp and Paper technology with video work shops for knowledge/skilled development.
Persons with higher qualification (R&D design, trouble shooting)	Tailor made special lab./ knowledge training programmes of varying duration.

All these with aim on productivity improvement will make changes in Human Resource Management. The new manpower need for future capacity and their distribution is shown in table 13.14.

- Raw Material procurement handling, storage and preparation, sludge and solid waste handling, transport, watch and ward, security, sanitation and health care will go to contractual/casual employment.
- Maintenance related activities will go to outside agencies. Concepts of annual maintenance contractors and captive contractors will grow.
- Energy conservation, Environment management, Safety, HRD, R&D will be areas with greater focus.
- Raw materials management will become an important function area.
- Finance and marketing areas will receive more focus due to greater competition and globalization.

TABLE—13
Future Manpower Usage

Capacity Range	No. of Persons* for 1000 TPA Capacity	
	New Green Field Units	Expanded/Mo dernized Units.
>300 TPD	8—10	10—15
150 TPD—300TPD	10—12	12—18
30—150 TPD	15—20	18—25
Below 30 TPD	20—30	25—40

* Further 20% additional manpower will be taken for casual/contract jobs.

TABLE—14
Distribution of Manpower in Future

Section	Upto 30 TPD Plants	30—300 TPD Plants.
Production & Maintenance	55—15	55—15
Marketing, purchase/finance	7.5 5	10 7.5
Raw Materials Management	10	5
R&D	2.5	2.5
Others	5	5

The number of persons to be trained can be asessed on the basis of the following :

—Demand projection made for paper earlier will be increased by 10% to cater to likely export commitments.

—Till year 2000 AD, 80% of additional capacity will come from expansion while 20% will be through greenfield units. Beyond year 2000, 60% additional capacity will be through green field unit. (50% of the new capacity will be through integrated pulp and paper making while the rest 50% will be through imported pulp/waete paper route). The capacity utilization will be 80%.

Model For Human Resource Development :

The proposed model for HRD programme for paper industry must basically meets the following objectives :

- To bring a rationality in the structure, curriculum, duration, quality of the programme is being run by various HRD institutions for first entry levels. The programmes have to be need based.
- Monitor the institutions/programmes in terms of funding, infrastructure, industry interactions.
- Help in planning/coordinating inservice personnel programmes (continuing education) of various durations on topics of specific interests. The identification of topics, preparing training packages and preparing the trainers are going to be major tasks.

These activities should be through a "National Advisory Board for HRD in Paper Industry" formed at national level by Development Council, Ministry of Industrial Development, AICTE and with active involvement of HRD institutes like IPT and professional bodies/industry.

The conduct of HRD programmes at first entry level must be left to HRD institutions which should be helped and monitored for quality inputs. The existing centre (like IPT) and one new centre in another part of the country can be made into "Nodal HRD

Centre" or "Technology centres" for course formulation, monitoring, upgradation of teachers/teaching materials. These HRD centre must be adequately funded to improve infrastructure, improve industry interaction, involve plans of hiring industry personnel (serving/retired) for class room inputs, move class room teachers to industry shopfloors.

New programmes have to be planned for ITI/ Worker levels with skill inputs. This is going to be quite challenging as the facilities in the area are practically non existant at the moment.

The development of HRD programmes for in service personnel will pose maximum challenge. This activity can be done broadly at two locations, namely mill site or in HRD institutions. Demand driven, economically viable, self sustaining systems for operators, supervisors, line managers and other personnel of paper industry should be the main objective. This can be achieved by developing 3 or 4 Regional Training Centres (RTC) with involvement of a core plant.

The RTC's will coordinate with mills, core plants, nodal centres (technology centres) in evolving suitable strategies in conduct of programmes. The National Advisory Board (NAB) alongwith Nodal Centres should formulate strategies for identification of programmes, preparing training materials (manuals, visuals, video tests, case studies), training the trainer and providing expert systems. The RTC's will concentrate on worker level/operator level mill based programmes for skill improvement while HRD centre should concentrate on programmes at other levels. This model can be broadened after initial experiences.

Conclusions :

The Indian paper industry is at cross roads. The challengers before it are very many. The options require a strong motivation to face the challenges. Proper human resource at all levels will be the strongest foundation to launch an assault on the challenges and convert the challenges to opportunities. Development of a competent, dynamic and able human resource for paper industry requires immediate action. The manpower working in mills has to be continuously updated at all levels. The fresh entry personnel should be capable of meeting the aspiration of the industry. The HRD institutions have to change their style of functioning. Industry must respond to the needs of HRD activity more positively. Need of the hour is a concerted effort with a direction. The time available is short. Results can be achieved if complacency gives way to action, dormancy gives way to commitment. The captains of industry, the governmental agencies and HRD centres must sit for a brain storming and success will come. The path is long and orderous. The challenge is great but with commitment the scene will change and Indian Paper Industry will find itself as an Asian Tiger and the human resource it will be second to none in the world. Let us wake up and act.

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