

Emerging opportunities for Australia in India's paper and paperboard market *

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Abstract

Radical economic reform programs initiated in India have led to a sharp rise in the trend rate of growth for India's economy. The rapid economic growth and socio-economic developments in India have boosted the country's consumption of many goods and services, including paper and paperboard. As the rapid economic growth and other developments continue, consumption of paper and paperboard in India will accelerate. The paper industry of India has however not been able fully to meet the consumption needs of its domestic market. Nor is it likely to do so for the foreseeable future when the country's consumption will be even greater. This is mainly because the industry is beset with problems such as a shortage of domestic supply of papermaking fibre, obsolete technology, and comparatively high cost of production. The situation thus presents a potential opportunity for the forest products industries of Australia to benefit from India's domestic market for paper and paperboard, papermaking fibres (pulp, recovered paper and pulpwood), and related services.

Introduction

The record of economic growth in independent India has been uneven. Until about 1980, the growth rates were low and subject to considerable volatility. This record has improved since then (table 1). In aggregate terms, growth appears to have picked up significantly since the 1980s. Further, the variability of the growth (as measured by the standard deviation) has fallen quite significantly. The mean annual growth of real gross domestic product (GDP) was 5.65 per cent during 1980-01 to 1989-90. During the next decade of 1990-91 to 1999-2000, the mean GDP growth rate per annum rose to 5.83 per cent. During the past three financial years the growth rate was 8.5 per cent in 2003-04, 7.5 per cent in 2004-05, and 8.4 per cent in 2005-06. The Indian economy

* A shorter version of this study was presented at the Australian Forest Growers International Biennial Conference, 22-25 October 2006, Launceston, Tasmania. The study has benefited from helpful comments by Tony Bartlett, Tim Bull and Peter Grist of Australian Government Department of Agriculture, Fisheries & Forestry; Paul Fairhall of Invest Australia, Australian Government's inward investment agency; Peter Kanowski and Phil Townsend of SRES, The Australian National University; and Steve Walker of Midway Plantations Pty Ltd, Geelong, Victoria; from information on India's paper industry supplied by R.K. Jain of Central Pulp & Paper Research Institute of India; and from trade statistics by Phill Sledge of ABARE, an Australian Government's economic research agency. However, the authors alone are responsible for any shortcomings in it.

has therefore been enjoying high and relatively stable rates of growth for almost a quarter century now.

Table 1: Some basic characteristics of growth of real gross national product, India

	Mean annual growth rate	Standard deviation of year to year growth rate
	%	%
1951-52 to 1959-60	3.58	2.62
1960-61 to 1969-70	3.91	3.64
1970-71 to 1979-80	3.05	4.16
1980-81 to 1989-90	5.65	2.27
1990-91 to 1999-00	5.83	1.97
1992-93 to 1999-00	6.46	1.16
2001-02 to 2005-06 ^(a)	6.82	1.99

(a) 2002-03 was a significant drought year and its inclusion raised the standard deviation of the growth rate. If 2002-03 is excluded the average growth for this period would have been 7.55 % and the standard deviation 1.2.

Source: Authors' calculation based on data from Reserve Bank of India Handbook of Statistics on the Indian Economy.

India is now a huge market with a large and young population. As much as 95.1 per cent of India's billion plus population is below the age of 65, with almost a third being younger than 14. A Reuters report estimates that by the time these children enter the labour force India will be a US\$1 trillion plus economy. According to another estimate, India's middle class (those earning between US\$20,000 to US\$22,000 a year) is 300 million strong.

After years of relative isolation, India is now more integrated with the international economy. Export growth has been spectacular.

Central to the growth success story has been a steady rise in India's saving (investment) rates from 23.4 per cent (22.6 per cent) of GDP in 2001-02 to 28.1 per cent (26.3 per cent) in 2003-04 and 29.1 per cent (28.5 per cent) in 2004-05. Public sector saving is still negative. Contributing to this are incomplete tax reforms and wasteful subsidies resulting in large fiscal deficits. With 28.5 per cent of GDP invested in 2003-04, India was able to obtain 8.5 per cent GDP growth whereas China obtained 9 per cent growth with an investment rate of over 40 per cent. This shows that the productivity of capital is higher in India than in China. With a young population, saving and investment rates in India are likely to rise further in the future.

Many internal economic factors should see India maintaining its rapid economic growth, thus expanding the market for a range of goods and services. Table

2 shows India's rapidly rising prosperity, table 3 the expanding market for consumer durable goods, and table 4 the fast growing market for an important paper product — the newspapers.

Table 2: Growing prosperity in India: number of households by annual income, at 2001-02 prices

Income	1995-96	2001-02	2005-06	2009-10^(f)
Rupees '000/year	Number	Number	Number	Number
<90	131,176	135,378	132,249	114,394
91-200	28,901	41,262	53,276	75,304
201-500	3,881	9,034	13,183	22,268
501-1,000	651	1,712	3,212	6,173
1,001-2,000	189	546	1,122	2,373
2,001-5,000	63	201	454	1,037
5,001-10,000	11	40	103	255
>10,000	5	20	52	141

(f) Forecast.

Note: Indian rupees 33.00 = Australian \$1.00, approximately.

Source: National Council of Applied Economic Research (2005).

Table 3: Demand for consumer durables, numbers, India

	1995-96	2001-02	2005-06	2009-10^(f)
	'000	'000	'000	'000
Cars	276	788	1,560	3,466
Motorcycles	760	2,599	4,663	8,369
Colour televisions	1,785	4,580	6,295	9,957
Whitegoods	3,437	6,024	8,727	13,149

(f) Forecast.

Source: National Council of Applied Economic Research (2005).

Table 4: Average annual total number of registered newspapers and their total circulation, and average annual growth rates, India

	Newspapers⁽¹⁾	Circulation⁽²⁾
	'000	'000
1993 to 1995	35	73,082
1996 to 1998	42	107,331
1999 to 2001	49	124,102
2002-03 to 2004-05	58	143,269
	%	%
Growth rate per year for the 10-year to 2004-05	5.2	7.5

(1) Newspaper is a printed (including cyclostyled) periodical work containing public news or comments on public news. Newspapers can be dailies, tri- or bi-weeklies, weeklies, fortnightlies, monthlies and of other periodicities.

(2) Circulation is the average number of copies sold and distributed free per publishing day. Actual circulation may be higher than the reported numbers because not all newspapers submitted their annual statements in time to be included in the annual reports.

Source: Government of India (2005).

The current high rate of economic growth could well accelerate further (Kelkar 2004; Thirlwell 2004). Contributing to this acceleration is a broad series of reforms including financial sector reforms, increased globalisation and the widening and deepening of product and financial markets. The impact of such reforms is reflected in key indicators such as market capitalisation of the stock market, the technology and transparency of transactions, the sets of instruments traded, balance sheets of financial institutions and the degree of openness of the economy. At the same time, a benign foreign direct investment policy framework has permitted greater tie-ups in high technology areas for production to supply domestic as well as external markets.

Adding to the impetus for higher economic growth are certain structural changes occurring in the Indian economy — the relative youth of the working population, a reduction in nutritional deprivation and improvement in skills (Jha 2005). As a result, India's labor force will be younger, better nourished and more skilled in the future. This will give a tremendous fillip to prospects for economic growth in India over the intermediate run.

These important developments present overseas businesses an opportunity to benefit from increasing their exports of goods and services to, and investments in, India. Our focus in this study is, however, only on the paper and paperboard market in India.

We first outline the opportunities in paper and paperboard segment, followed by those in papermaking fibres (pulp, recovered paper and pulpwood), and related services. After outlining the opportunities in general, we discuss the opportunities specifically for Australia. We end the study with brief concluding comments.

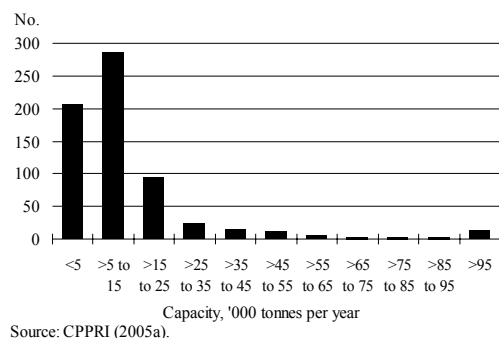
Opportunities to supply paper and paperboard

We begin by examining the current situation and the outlook for production, exports, imports and consumption of paper and paperboard in India.

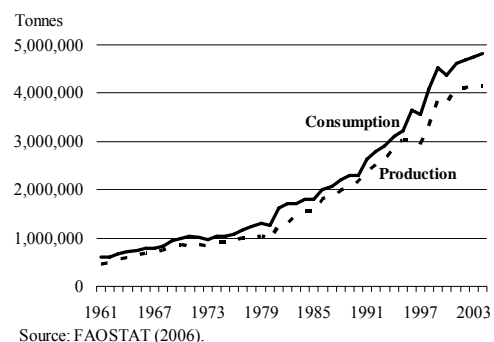
The government of India regards the paper industry as one of the 35 high priority industries of the country. The industry consists of 666 mills (Central Pulp and Paper Research Institute 2005a). Except for a few mills that are government-owned, the industry is in the private sector. Nearly $\frac{3}{4}$ of the mills had installed output capacity of less than or equal to 15,000 tonnes a year (chart A). Thus, although most mills are small, even large Indian mills are of only 'small' to 'medium' size by current

international trends (Toland 2005). Preponderance of small mills is not confined to paper industry; it is a common feature of India's manufacturing sector as a whole. It reflects the continuing effect of government policies in the past that favoured small-size firms (Kochhar, Kumar, Rajan, Subramanian and Tokatlidis 2006). High import tariffs in the past had long protected the industry, but at the expense of consumers. Average tariff rates, up to 35 per cent until recently, have now fallen to 12½ per cent, and are likely to fall further. Nevertheless, the tariffs are still high relative to those in the industrialised world and many developing countries. Unel (2003) analysed total factor productivity of 13 major manufacturing sub-sectors of India over the period of 1979-80 to 1997-98. His analysis showed that the paper sub-sector had the second lowest productivity growth rate. Most of the paper mills in India are not competitive against imports. Apart from the low quality of their product, these mills generally have low output relative to their installed capacity and high total cost of production due partly to small size of the mills and the steep cost of papermaking fibre (Jaakko Poyry Management Consulting (Europe) Oy 2002, pp. 208-223; Government of India 2006, p. 262). Not surprisingly, around ⅓ of the 666 mills are 'sick' — i.e. in poor financial condition, partly or fully idle or in various stages of being shut down. Notwithstanding these problems, aggregate production of paper and paperboard has not fallen as new mills, of larger size, came into production and some mills expanded their production capacities.

A: Distribution of paper mills, by capacity, India



B: Consumption and production of paper and paperboard, India, 1961-2004



Production of paper and paperboard in India has been rising steadily for at least 40 years (chart B). Average total annual production in recent years was 4.1 million tonnes. Table 5 gives the details on production of various categories of paper.

Table 5: Average annual production, exports, imports and consumption of paper and paperboard, India, 2002-2004

	Production	Exports	Imports	Consumption
	'000 t	'000 t	'000 t	'000 t
Newsprint	700	6	555	1,249
Printing and writing	1,530	97	106	1,539
Household and sanitary	40	0	3	43
Other paper and paperboard	1,861	45	104	1,920
Total paper and paperboard	4,131	148	768	4,751
(Value, US\$ million)		(110.2)	(435.4)	

Note: Consumption = Apparent consumption = Production – Exports + Imports.

Source: FAOSTAT (2006).

India exports paper and paperboard but the small and highly changeable quantities suggest the exports are transient rather than sustained. Moreover, the export volumes are consistently smaller than imports, implying that India is a long-standing net importer of paper and paperboard.

As has been the case with production, consumption of paper and paperboard has also risen steadily over the years (chart B). The growth in consumption was at an average rate of 5.1 per cent a year (and at a higher rate in recent years). It is also worth noting that not only has consumption exceeded production every year but the gap between consumption and production has also widened over time. And, as will be seen later, the gap is likely to widen even further in the future.

In absolute terms, India's aggregate annual consumption of paper and paperboard at 4.8 million tonnes may be regarded as large (compare, 3.9 million tonnes in Australia). But on per capita basis, it's a different story. During 2002-2004, average annual per capita consumption was only 4½ kg in India, compared with 42 kg in China, 55 kg in the world as a whole, and around 185-190 kg in Australia and New Zealand. An inference from India's low per capita consumption is that enormous scope exists for the consumption to rise in India in the future.

In view of the prospective improvement in factors that drive consumption up, such as per capita income and rate of literacy, Shahid (2001) and Sanyal (2002) suggest that India's average annual per capita consumption of paper and paperboard will rise to 8 kg by 2010. The Jaakko Poyry study (2002, p. 352) puts the rise at 8.75 kg by 2015. As regards aggregate consumption, several studies have provided the projections and/or have supported the proposition of its rapid expansion. These studies include Ahmed (1997), Zhu, Tomberlin and Buongiorno (1999), the Jaakko Poyry study (2002), Central Pulp and Paper Research Institute (2005b), Whiteman

(2005) and Government of India (2006). In addition, some of the print and on-line media have also reported projections of aggregate consumption. A summary of the projections in table 6 suggests that aggregate consumption is likely to rise to around 8 million tonnes by 2010.

Table 6: Projections of annual consumption of paper and paperboard, India

Studies, sources	2010-11 Million t/year	2015-16 Million t/year
Ahmed (1997, p. 34)	6.30-8.55	
Zhu, Tomberlin and Buongiorno (1999, p. 97)	4.34	
Jaakko Poyry Mgt. Consulting (Europe) (2002, p. 66)	8.20	11.10
Sanyal (2002)	8.50	
Central Pulp & Paper Research Institute (2005b, p. 50)	8.55	10.00
The Economics Times (2005)	8.30	
Paperex (2005)	8.00	
newKerala.com (2005)	8.50	10.80
Government of India (2006, p. 262)	11.00	

All sources of information that we have so far seen indicate that the increase in domestic production will not be able to keep pace with consumption (Ahmed 1997, p. 34; Zhu and others 1999, p. 245; the Jaakko Poyry study 2002, pp. 15-16; Sanyal 2002; Gurusurthy 2005). During 2002-2004, the annual production of paper and paperboard in India was 4.1 million tonnes and consumption 4.8 million tonnes (table 5). It means, consumption exceeded production by 0.7 million tonne a year. To get an idea of the magnitude of the future consumption-production gap, it is helpful to refer to the Jaakko Poyry study. According to its base scenario, the current annual consumption-production gap of 0.7 million tonne will become 1½ times greater during 2010-2015.

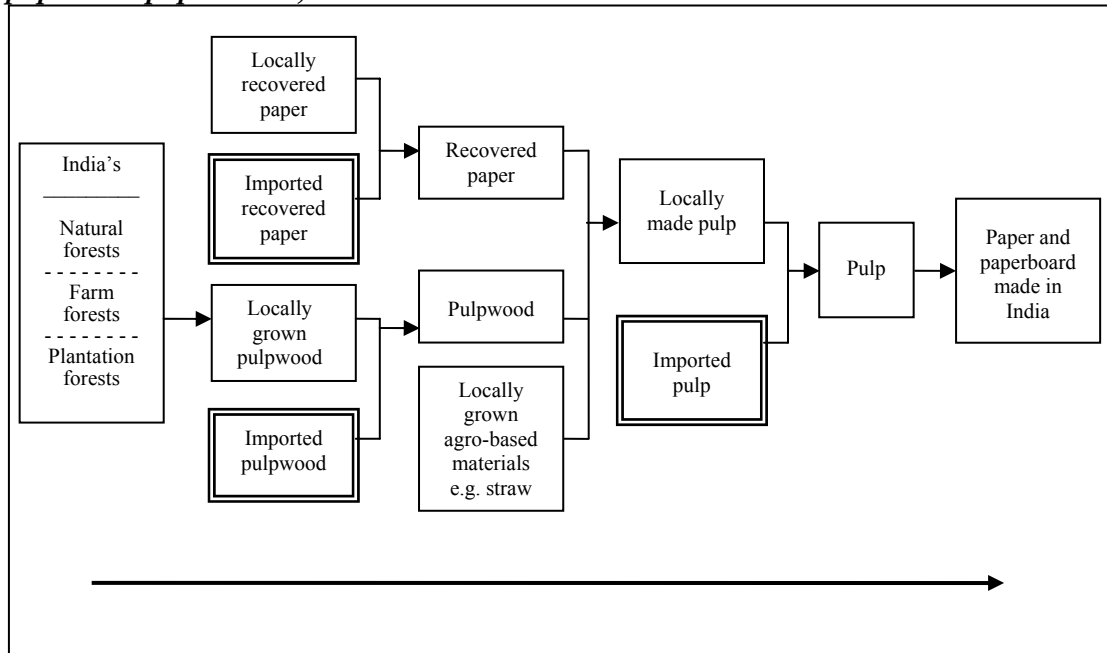
The widening consumption-production gap implies the paper and paperboard market in India will remain characterised by its increased reliance on imports for the foreseeable future. Thus, India offers opportunities to overseas producers who have excess supplies of paper and paperboard.

Opportunities to supply papermaking fibres

Pulp is a most basic raw material for manufacturing paper and paperboard. For producing pulp itself, the most basic raw materials are pulpwood, agro-based materials e.g. straw, and recovered paper or wastepaper. The Indian paper industry uses all of these raw materials. Chart C explains the input of these papermaking fibres

into production of paper and paperboard in India. In view of their importance, we now discuss the situation and outlook for these papermaking fibres, beginning with pulpwood from natural forests, farm forests and plantations.

C: A prototype flow-chart of papermaking fibres for producing pulp and finally paper and paperboard, India



Natural forests and farm forests

Natural forests in India are owned and managed by various levels of government. Under the current National Forest Policy, production of industrial wood is no longer the function of the forests; in stead, their main functions are to provide ecological and environmental services and to meet subsistence needs of forest-dependent village communities. Wood from the forests is therefore not available to wood-based industries, including paper industry (Government of India 1988, paragraph 4.9). National Forest Policy advises the industries to meet their wood requirements by joint venture farm forestry and to use alternative raw materials. Many paper mills have set up joint ventures with farmers for wood supplies. In general, however, the joint venture approach has not proven as successful as the National Forest Policy had expected (Balaji 2002; Saigal 2002; Government of India 2006, p. 266). Some farmers who took up commercial farm forestry on their own accounts have faced serious marketing and other problems (Ballabh 2000; Gera, Mohan, Negi and Bisht 2005). From the standpoint of paper mills, the mills have to deal with numerous farmers to

obtain meaningful supplies of pulpwood, which increases transaction costs for the mills. Under the circumstances, we do not expect a significant change either in the uptake of farm forestry despite its potential or in the National Forest Policy on natural forests. As a result, neither natural forests nor farm forests are likely meet the pulpwood needs of the paper industry in the foreseeable future.

Plantation forests

India has over 30 million hectares of plantation forests, which is a massive area (compare, 1.7 million hectares in Australia). However, the area of plantations has been significantly overestimated (for detail, see Pandey 2002). Serious uncertainty therefore exists about the actual area. Other features of the plantations are that most of them are government owned, have generally very low productivity, and their main function is to produce fuel wood, with only a small portion of the total output available as pulpwood (Pandey 2002; Saigal 2002). Hence, we do not expect the apparently massive area of plantations to meet the pulpwood needs of the paper industry.

In view of the limited prospects of securing pulpwood from the natural, farm and plantation forests, the paper industry has lobbied the governments for access to degraded and wastelands for establishing industrial plantations. The area of the public degraded and wastelands in India runs into tens of million hectares. In response, some state governments, e.g. of Tamil Nadu state, are willing to grant access to the lands (Government of India 2006, p. 267). However, many environmental and other groups strongly oppose it (Saigal 2002, p. 19). Over-exploitation of natural resources and pollution of the environment by sections of the industry have caused a loss of some public trust in the industry. Besides, the degraded and wastelands have other competing uses e.g. production of food and bio-fuels. Even if some land is made available, its location, quality and area may not be satisfactory from the standpoint of paper mills. Furthermore, years must pass between setting up plantations and getting wood supplies from them. In view of these hurdles, we have serious reservations on the prospects of plantations meeting the industry's pulpwood needs in the foreseeable future. The following headlines and news reports in the Indian media support our reservations:

Paper meet urges Govt to address raw material shortage ‘The shortage of raw materials is a key issue being faced by the industry...’ (The Hindu Business Line, 4 March 2005)

Raw material sourcing biggest challenge for paper industry (Business Standard, 23 February 2006)

BILT scouts for captive forests in Indonesia, Malaysia ‘Ballarpur Industries Ltd (BILT), the country’s largest paper manufacturer, is planning to lease land for captive [plantation] forestry in Indonesia or Malaysia to feed its seven paper mills in India.’ (The Hindu Business Line, 2 July 2004)

Ballarpur Industries eyes SE Asian market for buys ‘It is our plan to strengthen the source of our raw material, which is fibre. It can either be through cultivating the raw material overseas or buying a pulp facility and then shipping the product to our units in India....We’re looking at options in Vietnam, Malaysia and Indonesia.’ (The Economic Times, 30 January 2006)

Aditya Birla to set up pulp unit in Laos ‘The Aditya Birla Group plans to increase its capacity to make rayon grade pulp by building a plant in Laos, costing about [US]\$350 million. The group said it also plans to develop plantations in Laos that will supply the wood for the pulp mill. (The Economic Times, 18 March 2006).

These media headlines and news reports clearly show that India’s leading paper manufacturers have reservations on the ability of the domestic forests — be they natural, farm or plantation forests — fully to satisfy their pulpwood needs. Otherwise, why would they be seeking to invest in plantations, and pulp mills, overseas rather than at home in India? The very idea of looking overseas is also indicative of sections of the paper industry considering importing pulpwood in future.

Taking a wider view, it may be noted that India’s forests are not able fully to meet the domestic needs for saw and veneer logs as well. World Bank (2006, pp. 7-8) quotes India’s timber supply deficit is 39 million cubic metres in 2006. The National Forest Commission admits ‘India is facing a severe scarcity of wood’ (Government of India 2006, p. 261). And, news headlines read, ‘Country facing wood famine’ (The Hindu, 10 November 2005). Evidently, India has a major deficit in domestic supply of logs for pulp as well as sawnwood, ply and veneer.

Agro-based materials

Agro-based materials are mainly agricultural residues, such as bagasse and straw. In 1970, they accounted for 9 per cent of the total raw materials used in producing pulp in India and, by 2004, their contribution rose to 29 per cent (table 7). The three-fold increase in the relative contribution was partly because the mills were encountering mounting difficulties in obtaining enough pulpwood from the forests, and at the same time the government policies were promoting setting up of ‘mini mills’ across the country, with agricultural residues as the main raw material for them. As a result, small to medium size mills became dominant users of agricultural residues. Larger mills chose to rely less on agricultural residues because of some specific problems associated with this material. Problems include the seasonal supply of agricultural residues necessitates their storage for many months, thus giving rise to cost of storage; significant uncertainties in the supply from one year to the next owing to changes in cropping mix and other factors such as drought; and relatively high cost of collecting and transporting the rather bulky material from widely dispersed locations. The increased use of agricultural residues has also been partly responsible for a rise in environmental pollution: ‘The black liquor scorches the fields or the rivers where it [the mill effluent] is let into. An effluent treatment plant [for some mills]...may cost as much as the paper mill itself...’ (Viswanathan 2004). Besides damaging the environment, both small and large mills use far more energy and fresh water resources per unit of paper output; for detail, see the Jaakko Poyry study (2002, pp. 231, 337-340) and Centre for Science and Environment (2004). Notwithstanding, agro-based materials are an important raw material for the paper industry. However, as table 7 shows, their role relative to other sources of fibre is unlikely to increase significantly in the future.

Table 7: Shares of raw material groups in total production of pulp, India

	1970	2004	2010 ^(f)
	%	%	%
Agro-based materials	9	29	28
Forest based fibre	84	36	40
Recovered paper	7	35	32

(f) Forecast.

Source: Jain, Singh and Kulkarni (2005).

Pulp and recovered paper

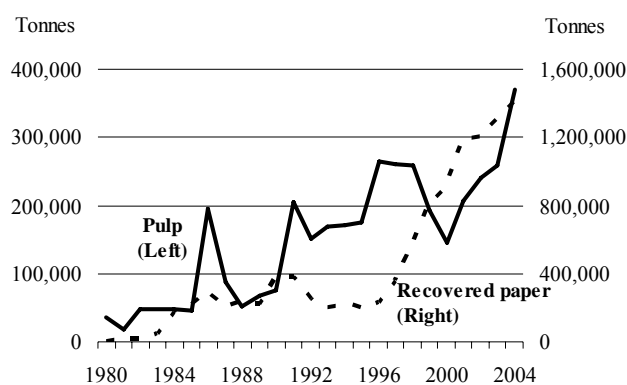
The Indian paper industry uses recovered paper to produce pulp. However, domestic supplies of recovered paper and of pulp (produced from pulpwood, agro-based materials and recovered paper) are not enough to meet the industry's needs. To meet the shortfall, India imports both pulp and recovered paper (table 8) and, as chart D shows, imports of both have increased significantly over time. An important point to note is that imports of these two materials have gone up much faster than the rise in output of paper and paperboard. During the 25-year period to 2004, India's output of paper and paperboard increased at an average annual rate of 5.7 per cent, but its annual net imports of pulp shot up at the rate of 9.2 per cent and of recovered paper at 16.9 per cent. The much higher growth rates of imports of pulp and recovered paper vis-à-vis the rate for output of paper and paperboard imply a heightened reliance on imports of papermaking fibre. As mentioned earlier, India's reliance on imports of pulp and recovered paper is likely to extend to pulpwood in the future, although at present India does not import pulpwood.

Table 8: Imports of pulp for paper and of recovered paper, India

	2002	2003	2004	Average/year
	'000 t	'000 t	'000 t	'000 t
Pulp for paper				
Mechanical wood pulp	29.0	35.6	35.6	33.4
Semi-chemical wood pulp	36.0	58.5	58.5	51.0
Chemical wood pulp	174.5	163.4	274.3	204.1
Other fibre pulp	1.4	1.4	1.4	1.4
Total	240.9	258.9	369.8	289.9
(Value, US\$ million)	(104.7)	(111.7)	(176.7)	(131.0)
Recovered paper	1,200.0	1,324.0	1,414.5	1,312.8
(Value, US\$ million)	(149.6)	(175.1)	(224.6)	(183.1)

Source: FAOSTAT (2006).

D: Imports of pulp for paper and of recovered paper, India, 1980-2004



Source: FAOSTAT (2006).

The inference from the above discussion is that India's heightened reliance on imports of recovered paper and pulp will not only continue into the foreseeable future but that the reliance is highly likely to get bigger and extend to imports of pulpwood.

Opportunities in provision of the services

The issue of trade in the services is very important. However, at present we do not have enough details on the Indian paper industry's needs for these. Hence, until we have the details, we postpone discussion of the issue. Nonetheless, we have identified a few services specifically for Australia, which we describe in the following section.

Opportunities for Australia

India's consumption of paper and paperboard is set to rise further, but its paper industry will remain unable to fully satisfy the consumption needs of the country in the foreseeable future. Consequently, India's imports of paper and paperboard will continue to rise. This offers an opportunity to any country that has excess supplies of paper and paperboard. Australia — a net importer of paper and paperboard — is unlikely to take up this opportunity. Nonetheless, it is interesting to note that Australia has been availing itself of the opportunity, albeit in a small way, to export newsprint to India. During 2001-2005, average annual value of the export was between \$0.3 million and \$1.7 million, depending on whether one consults the Australian or the Indian government statistics.

Due to the worsening domestic shortage of pulp and recovered paper, India's imports of both materials have been rising fast, and the trend is likely to continue for the foreseeable future. Australia is a net importer of pulp, and it does not export pulp to India. However, if the current proposals to set up pulp mills in Victoria, South Australia and Tasmania come to fruition, Australia will have an exportable surplus of pulp. In that event, India can be one of the markets for it.

Australia has a surplus of recovered paper, and about 4 per cent of the surplus goes to India. Average value of the export during 2001-2005 varied between \$2.5 million and \$3.7 million a year, representing merely 1 per cent of India's total imports of recovered paper from all countries. It would seem there is scope for Australian exports of recovered paper to India to rise considerably.

To tackle the problem of shortfall in domestic supplies of pulpwood and pulp, sections of India's paper industry are considering investing in plantations and pulp mills in Laos, Vietnam, Indonesia and Malaysia. But not in Australia!

Australia is among the world's leading exporters and efficient producers of pulpwood, and it continues to welcome foreign investment in plantations and processing of logs into pulp and other products. Notwithstanding, Indian paper mills omitted Australia as a destination for their investments in plantations and pulp mills. As India is potentially a huge market, the question of omission of Australia deserves an in-depth study to identify the reasons for the omission of Australia and recommend remedial measures. The study should also identify the attributes of Australia's competitors that make them attractive destinations for foreign investments in plantations and value-added log products. Such study can lead to policy reforms and actions here that will help Australia achieve its 'Plantations for Australia: The 2020 Vision' policy objectives more quickly and efficiently.

We are aware of some activities aimed at gaining a better understanding of the Indian market and at attracting investment from India into Australia. For example, the J.W. Gottstein Memorial Trust Fund <<http://www.gottsteintrust.org/>> commissioned a study of pulpwood situation in India by granting a fellowship to Mr Steve Walker of Midway Plantations Pty Ltd, Geelong, Victoria. Following a visit to India in February-March 2006, Mr Walker has produced a highly informative report <<http://www.gottsteintrust.org/media/swalker.pdf>>. Similarly, Invest Australia <<http://www.investaustralia.gov.au/>> is increasing its capacity and activities in India to attract additional investment into Australia from India (P. Fairhall, personal communication, 26 May 2006). These steps are in the right direction and commendable. However, they are not adequate substitutes for an in-depth study of the type we have advocated above.

We now turn to the opportunities for Australia in providing the services. In this connection, direct or indirect investment in the Indian paper industry, or in the businesses that provide services to it, is an obvious candidate. But for going beyond the obvious, it is helpful to remember at the outset that, first, Australia has been successful in expanding its plantation forests through various policies, programs and institutional arrangements. Second, Australia has attracted investment in plantations and forest products industry from countries such as the United States, Japan and Korea. Third, Australia has a highly competitive woodchip export industry. Fourth,

Australian plantations have a considerably higher productivity than those in India. Exchange or trade with India in these and in other Australian experiences — such as forest certification, regional forest agreements, and forestry training and education — have the potential to benefit both countries. To illustrate the point, we draw attention to a current research project by the Australian Centre for International Agricultural Research, which has commissioned the CSIRO Division of Forestry and Forest Products to help improve the productivity of eucalypt plantations in India. Productivity as measured by mean annual increment in wood per hectare per year for short rotation eucalypt plantations is 15-20 cubic metres in Australia and 8-12 cubic metres in India (Australian Government 2005; Pandey 2002). This farsighted project, involving researchers from Australia as well as India, aims to contribute towards an improvement in the productivity of plantations in both countries. For detail, see <<http://www.aciar.gov.au/web.nsf/projectprint/ACIA-68K3KK?opendocument>>.

Concluding comments

We have shown that considerable opportunities are beginning to emerge in the rapidly growing Indian market. These opportunities have the potential to benefit forest and forest products industries of Australia or of any country that has excess supplies of paper, paperboard, papermaking fibres and services.

Sections of India's paper industry are investing in plantations and pulp mills in Southeast Asia but not in Australia. We have proposed an investigation into this issue as being in Australia's interest. It appears the time has come for Australia to be proactive in exploring and seizing such opportunities in India.

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