

# Analysis of Development Phases and Growth of Paper Industry

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## ABSTRACT

Paper industry possesses an important position in the Indian Economy for its vital role of early industrialization and social sector development. Paper products are used in education, healthcare, food, trade, communication and packaging. The population of India has been growing at a significant rate which has led to the increase in the demand of paper as each individual utilizes paper and other related products. Increasing population and literacy rate, improvement in manufacturing sector and lifestyle of individuals are expected to account for the growth in the paper industry of India. The focus of paper industry is now shifting towards more eco-friendly products and technology. The present paper has an overlook of paper industry in India.

## 1. Introduction

The word paper is derived from the Latin word from the name of the reedy plant 'papyrus' and French 'papier' (Kulshrestha: 1988). Paper is a material made of cellulose pulp, derived mainly from wood, rags and certain grasses, processed into flexible sheets or rolls by deposit from an aqueous suspension and used chiefly for writing, printing and drawing, wrapping and covering.

The origin of paper goes to the early Egyptian civilization. The origin and development of paper industry is segregated in five stages and presented in the following table:

### Paper Industry – Developmental Phases

| Phase  | Period covered | Development Process  |
|--------|----------------|--|
| First  | 1800-1860      | Mechanization – rags preparation, use of filler, pulp beating and paper machine  |
| Second | 1840-1880      | Industrial scale rags substitute (ground wood/chemical pulp)<br>Appropriate pulp mills were developed  |
| Third  | 1860-1950      | Enlargement of web width - 85 to 770cm<br>Increase in n 5 mpm production speed to 500mpm<br>Introduction of electric drive<br>Machines to produce particular type of paper |
| Fourth | 1950-1980      | Further increase in web width working speed, use of new materials (TMP, dinked paper, new filler, chemicals and dyes), new sheet forming                                   |

|       |              |  |
|-------|--------------|--|
|       |              |  |
| Fifth | 1980 onwards | Leads into future<br>Evolution of new sheet forming principles and chemical pulp processes |

India is fastest growing pulp and paper market in the world with growth rate of 16% over one year in per capita consumption, which is expected to grow in future. The Indian paper industry is among the top 14 global players today, with an output of more than six millions tones annually with an estimated turnover of Rs 160,000 millions.

Chinese papermaking techniques reached Korea at an early date and were introduced to Japan in the year 610. In these two countries, paper is still made by hand on a large scale in the old tradition, preferably from the fresh bast fibres of the mulberry tree (koko in Japanese). Very soon, knowledge of papermaking spread to Central Asia and Tibet and then on to India.

## 2. Types of Papers Produced in Paper Industry

There are different types and grades of paper for different uses, which are often reflected in their names.

### a) Coated Papers

It is best suited for higher-quality jobs. Coated papers may be gloss-coated, dull-coated, machine-coated, and cast-coated on one or both sides. Printing ink does not soak into a coated sheet as much as it does with an uncoated paper. So, coated papers can make halftones and color images look richer. Coated papers are associated with corporate capability brochures and annual reports. Since coated papers come in several grades and prices, user should not have to shy away from using them. Today, more and

more coated papers are recycled, which also lowers their costs.

#### b) Uncoated Papers

Uncoated papers are also known as text. These papers can be excellent sheets for printing. Some uncoated papers are so smooth that it's hard to tell that they're not coated. Uncoated papers are manufactured in many textures and colors. Uncoated papers are used for halftones, when the designer is trying to achieve a certain effect or look.

#### c) Bond

It is often used for stationery. It takes ink well from a laser printer or a pen. Part of this absorbency comes from the paper's rag content, which is the percentage of cotton fiber in a sheet of bond. Twenty five per cent or 50 percent is the usual amount added.

#### d) Note Book Paper

It is used, for books and textbooks. These papers come in antique or smooth finishes. They also come in many weight so that a book can be bulked up or down.

#### e) Offset Papers

It is similar to the coated and uncoated sheets. It resists the moisture that occurs in offset printing.

#### f) Index Papers

It is stiff. It takes writing ink well. Index papers are less expensive than cover grades. Index papers are used for cards or tabs and are also used in place of the more expensive cover stocks. They come in a smooth or vellum finish.

#### g) Newsprint Papers

As their name suggests, they are used for newspapers. The sheets are not as white as other papers. Ink tends to soak into them. Being relatively inexpensive, newsprint is ideal for the large volumes of paper that modern newspapers need.

#### h) Computer Paper

This is the general term used to describe paper used in a computer. It can also refer to paper used with a copier or for a laser printer. This is because of the move from the dot-matrix printer to the laser and inkjet printers. If so, take a look below for some valuable information that may help you in your search.

#### i) Copier Paper

It is standard paper used for copies. It is 20 per grams square meter, thin and somewhat transparent. Copier Paper has many different properties that affect the quality of the copies. White Point - Contrast is a key element between the toner and the paper. The whiter the paper the better your copies, Texture- The smoother the paper, the better the toner transfers to it. Smoother paper gives sharper copies and better fills.

#### j) Coating

Coating paper needs some type of clay or dust coating to help the paper separate and feed it. Most copier paper will have some type of indicator to show which side should be copied on.

#### k) Gloss Paper

It is ideal for photographic images, posters and printing of graphic designs. Matte Paper -is a high resolution bright white coated paper. Ideal is for everyday printing and it features superior drying properties.

#### l) Picture Paper

It is water resistant. It dries spontaneously for easy handling. This inkjet paper, in the popular 4" x 6" format, is ideal for consumer use.

#### m) Inkjet Paper

If the task is a printing of a document an email or memo, plain copier paper will work best. If color is important, then coated paper stock is preferred. Coated paper allows colors to be sharper than regular copier paper. A high level of coating allows for a high print resolution from 600 dpi -1440 dpi. There are many different types of paper available. But, only coated papers designed specifically for inkjet printers, will give the highest quality output.

### Various Types of Paper Industry:-

#### a) Wood Based industry

Forest policy should be revised with a view to raising plantation by industry/Cooperatives of farmers/State Government.

#### b) Waste Paper based Industry

Introduction of ecolabeling system wherein products made from recycled fiber, are rated higher than the products made from virgin fiber.

#### c) Agro Based Industry

Funds are made available for technology up-gradation for handling and processing of agro residue fiber, in small and medium scale industries.

### 3. Paper Industry in Tamil Nadu

Tamil Nadu is one of the well developed states in terms of industrial development. It has enjoyed a significant position in India's geopolitical space and economic progress. Logistical advantages due to presence of three major seaports, an international airport and several domestic airports, quality of human resources, a peaceful industrial climate and a positive work culture have strengthened Tamil Nadu's standing in the industrial world. Tamil Nadu continues to be one of the forerunners in the production of paper and paper products. There are 28 paper mills in operation in Tamil Nadu. The total paper production was 3.7 lakh tons in 2005 - 06, which accounts for 17.30 per cent share of the national production.

**Table No.3.5**  
**Total Paper Production in Tamil Nadu**

| Year        | Total Paper Production in Tamil Nadu (lakh tonnes) |
|-------------|--|
| 2011 – 2012 | 5.9  |
| 2012 - 2013 | 6.3  |
| 2013 - 2014 | 6.9  |
| 2014 - 2015 | 7.2  |
| 2015 - 2016 | 7.8  |

Source: Indian Pulp & Paper Technical Association Industrial Directory – 2010

As the country's forest cover is much below the desired level, the Government of Tamil Nadu established Tamilnadu news print limited in 1979 to manufacture newsprint and paper using bagasse (sugarcane waste) as the primary raw material. This is the largest paper mill in India with an installed capacity of 2,30,000 TPA (tons per annum). In 2005-2006, the company produced 230079 MTs of newsprint and printing and writing paper.

Tamil Nadu is engaged in the manufacturing of writing and printing paper (WPP) and news print. It is the 2nd largest producer of WPP in southern India and has the largest paper plant of the country in terms of capacity.

Tamil Nadu is the largest producer of biogases-based paper in the world especially at 'Tamilnadu news print limited'.

Some more factors which would add up to benefit the paper sector are: The targeted rise in Exports which anticipates them to go up to 0.7 percent of global trade, Increased agriculture export which would also benefit the sector in terms of increased demand for packaging material, similar would be the effect of a booming Indian Retail Market & Robust FMCG players.

#### 4. Problems and Issues of Indian Paper Industry

The Indian paper industry faces the following problems

##### (1) Non-availability of good quality of raw materials:

It is obvious that a right combination of pulp and paper markets and wood raw materials is a prerequisite for developing new industries and establishes a basis for selecting the type and size of the development. While domestic or regional markets in the tropical countries are often relatively limited and can support a type and size of plant which would not be internationally competitive, these markets are often protected and can in some cases accept products which are not of the best quality. To be competitive on international markets, pulp and paper development normally needs large quantities of wood at relatively low cost. The type and quality of wood which a pulp and paper mill can use from the technical point of view and the price the mill can afford to pay for the wood vary widely depending on the market. The three basic and most important questions regarding the feasibility of using wood for pulp and paper production are thus:

1. Markets for products,
2. Type and quality of wood,
3. Quantity and cost of wood.

Forecasting future markets is a well-established and relatively simple procedure which needs no further discussion within the scope of this paper. Classifying the wood to be either coniferous or broad-leaved type is sufficient to indicate the broad pulp and paper categories for which it can be used. Regarding quality, an extremely important factor is uniformity of wood in terms of uniform density and uniform fibre dimensions. It should be noted that, while the softwood species have a wider and more versatile use for pulp and paper products than hardwood species, long-fibred softwood cannot be said to be of better quality than short-fibred hardwood without specifying for what product the wood is used and without considering product quality requirements and economics of operation.

##### (2) Lack of modernization and basic infrastructure:

This point explains the investments in modernization and innovation on productivity in a sample of firms in the global pulp and paper industry. This industry is important because it has traditionally accounted for significant amounts of employment and capital investment. In contrast to much of the existing literature which focuses on the impact of R&D and patents on firms' performance and productivity, actual investment transactions in four main areas of operations such as mechanicals, chemicals, monitoring devices and Information technology.

##### (3) Increased emerging environmental issues

###### a) Deforestation

Worldwide consumption of paper has risen by 400% in the past 40 years, with 35% of harvested trees being used for paper manufacture. Logging of old growth forests accounts for less than 10% of wood pulp, but is one of the most controversial issues. Plantation forest, from where the majority of wood for pulping is obtained, is generally a monoculture and this raises concerns over the ecological effects of the practice.

###### b) Air pollution

Nitrogen dioxide (NO<sub>2</sub>) sulfur dioxide (SO<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) are all emitted during paper manufacturing. Nitrogen dioxide and sulfur dioxide are major contributors of acid rain, where as CO<sub>2</sub> is a greenhouse gas responsible for climate change.

###### c) Water pollution

Waste water discharges for a pulp and paper mill contains solids, nutrients and dissolved organic matter, and unless at low levels these are classed as pollutants. Organic matter dissolved in fresh water, measured by Biological Oxygen Demand (BOD), changes ecological characteristics, and in worse case scenarios leads to death of all higher living organisms..

#### (4) Resource Development

Currently companies face pressures not only from the customers and competitors but also from other agents of the distribution channel such as retailers and wholesalers. In this situation, companies are trying to differentiate themselves from domestic and international competition through innovation, branding and product marketing. However, decisions in innovation are becoming more complex since new technologies involve high risk and uncertainty. Moreover, consumer expectations have continuously risen and continue to challenge manufacturers in the area of product cost, speed to market, and innovative feature sets.

#### 5. Conclusion

Paper industries would achieve higher portability and free cash flows due to lower capital expenditure, and this would help in development of industry. The globalization of Indian economy has led to a healthy growth of 8 to 9 per cent industry and that is growth happening in all the sectors. To face future challenges, the Indian Paper Industry has been focusing on repositioning of product lines, improving internal efficiencies and making investments in expansion and building production capacities and to further penetrate in the global market.

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