

REPORT
OF THE
PANEL ON PAPER, PULP, BOARD
AND
CHEMICAL COTTON INDUSTRIES



Government of India
Department of Industries & Supplies

Price As. -/7/- or 8d.

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INTRODUCTION

The Government of India in the Department of Planning and Development constituted a Panel to consider and advise them regarding the possibilities of the post-war development of Paper, Board, Pulp and Chemical Cotton Industries. The Panel consisted of the following :—

Chairman :—

Mr. M. L. Narasimiengar.

Members :—

Mr. G. P. Birla.

Mr. M. P. Bhargava.

Dr. A. Schoenberg.

Mr. Jagraj.

Mr. Laiq Ali. (Since Mr. Laiq Ali was out of India for most of the time, Mr. K. Nizamuddin attended the meetings of the Panel on his behalf.)

Secretary.

Mr. A. S. Bhatnagar, Assistant Industrial Adviser.

Mr. C. D. Thakkar was subsequently co-opted as a member of the Panel.

The following general directive was issued by the Government of India to indicate the scope of the Panel and the procedure to be followed by it.

General Directive to Industrial Panels.

1. It is the function of panels to make recommendations to Government regarding the development of industries, both existing and new. These recommendations should be so framed as to enable Government to prepare a detailed phased plan for the five years following the cessation of hostilities, as the first stage of a 15-year plan of industrial development for the whole country.

2. In order to assist them to formulate recommendations, panels will be supplied, as far as possible, with factual information prepared by the panel secretaries. In the case of new industries, the information will consist of a general survey of the industry and the importance of starting it in India, the availability of raw material, the power requirements, the demands of the Indian markets and the probabilities of exports. In the case of existing industries, the information will naturally be more comprehensive; it will indicate in addition, the location of existing units, the types of goods produced, the total production under each category and the assistance, if any given by Government. These items are to be regarded as illustrative and not exhaustive:

Government will give each panel, as a basis for discussion, the provincial target to be aimed at in the first five-year period and, wherever possible, of the target to be reached in 15 years.

3. The recommendations of the panels should cover the following points. :—

(1) The scope and extent of development, including the type of products recommended.

(1-A) The estimated requirements of capital goods together with such details of those requirements as may be available in India and how much should be imported from abroad.

(2) Whether the industry should be under Government ownership either on grounds of national interest or because private capital is unlikely to take it up, and if so, whether it should be wholly or partly managed by Government.

(3) In the case of industries to be developed other than under State ownership, the capital required for such development, whether the whole of it is likely to be available by public investment and, if not, the extent to which Government assistance may be required.

(4) The extent to which technical advice from abroad may be necessary.

(4-A). The availability and the future requirements of technical personnel so as to obtain a clearer indication of the present shortcomings and future needs.

(5) The manner and the degree of co-operation with foreign firms considered necessary and desirable, both as regards capital and management.

(6) The location of the industry.

(7) The nature of the assistance required from Government in the form of protective duties, bounties, research grant, expert advice, etc.

(7-A). The relative incidence of the import duty on the finished goods in comparison with the duty on the raw materials from which they can be manufactured.

(8) If the industry is to be under private ownership and management, what controls, if any, should be exercised by Government.

(9) What should be the organisation of the different units of the industry, *e.g.*, should there be an industrial association? Would a cartel be desirable?

(10) The stages by which the industry should be developed.

(11) Should the Industry cater for the export market?

(12) Should the industry be developed, as in Japan, on the cottage industry basis and, if so, to what extent?

4. Although, as stated above, the panels may recommend the grant of protection, it will not be their function to consider broad questions of international trade and commercial policy.

5. Joint meetings of the panels should be held, wherever necessary, to secure co-ordination particularly where the processes and the products of one industry are connected with those of another.

6. Some of the panels have been drawn broadly and it may be necessary to co-opt members for dealing with specific branches of the industry. Members may be co-opted by the Chairman in consultation with the Industrial Adviser.

7. Before submitting recommendations, panels should consult Provincial Industrial Committees, particularly in the matter of location of industry. They should also, where the circumstances of the case require it, consult Industrial Committees in States or State Governments bar Durbars. The recommendations should be submitted to Government through the Industrial Adviser.

III. A preliminary note containing factual information about the industry was prepared by the Secretary and was circulated amongst the members of the Panel before its first meeting.

IV. The Panel met on the following dates:—

- (a) First meeting held on the 24th July, 1945 at New Delhi.
- (b) Second meeting held on the 5th and 6th September, 1945 at Dchra Dun.
- (c) Third meeting held on the 7th, 8th and 9th November, 1945 at Calcutta.
- (d) Fourth meeting held on the 19th and 20th February, 1946 at New Delhi.
- (e) Fifth meeting held on the 26th and 27th April, 1946 at New Delhi.
- (f) Joint meeting with representatives of Provincial and State Governments and their Industries Committees held on the 12th July, 1946 at New Delhi.
- (g) Seventh meeting held on the 19th November, 1946 at New Delhi.

V. The Panel sought the advice of the following persons and representatives of Associations at various stages of its deliberations:—

1. Mr. D. G. Currie, Director of Paper, Directorate General of Supply, New Delhi.
2. Mr. A. A. Whitley, Deputy Controller of Printing and Stationery, Government of India.
3. Mr. Shanti Parshad Jain. } Representatives of
4. Mr. Karam Chand Thapar. } Indian Paper Mills
5. Mr. K. C. Kothari. } Association.
6. Mr. T. H. Todd. } Bengal
7. Mr. R. C. Webster } Paper
8. Mr. R. A. Graham } Mills.
9. Mr. A. P. Benthall } Titaghur
10. Mr. E. S. Mitchell } Paper
11. Mr. E. C. Gosh } Mills.
12. Mr. Karam Chand Thapar } Shree Gopal
13. Mr. Sardana } Paper Mills.
14. Mr. H. N. Chaudhuri } India Paper
15. Mr. R. Fraser } & Pulp Co. }

Representatives of
Indian Paper Makers
Association.

16. Mr. R. K. Murthy, representing Messrs. J. P. Advani, & Co.,
Bombay.
17. Mr. R. N. Dutt, representing Messrs. Bholanath Dutt & Sons,
Calcutta.
18. Mr. D. Y. Athawale, representing Director of Industries, U.P.
19. Mr. T. Venkajee, representing Director of Industries and
Commerce, Madras.
20. Mr. Seshadriyengar, representing Director of Industries,
Bombay.
21. Mr. D. N. Ghosh. } representing Director of Indus-
22. Mr. Khan. } tries, Bengal.

The Panel is greatly obliged to these gentlemen and several other officials and non-officials and private concerns (to whom questionnaires were sent from time to time) for their willing help and valued advice. The Panel is also grateful to Mr. D. G. Currie and Mr. M. P. Bhargava for supplying some of the appendices attached to this report.

VI. Grateful thanks of the Panel are also due to the Chairman for his able guidance at the meetings and for his keen interest in the work of the Panel.

VII. The Panel places on record its high appreciation of the valuable services rendered by the Secretary, Mr. A. S. Bhatnagar and his assistants in satisfactorily getting through the work connected with the Panel.

PART I.

Paper and Board Industries.

PAPER INDUSTRIES.

Earlier Developments:—

Hand-made paper has been produced in the country for centuries at a number of centres. With the advent of machine-made paper it has steadily lost importance and the art has gradually faded out.

2. The production of machine-made paper in India dates back to the year 1870, when the first paper mill named Bally Mills was started on the banks of the Hoogly and it is in this neighbourhood that the principal seat of the industry still exists. Bally Mills started with a single machine but in course of time were able to increase the number to four, with an output of over 5,000 tons per annum. Their success was, however not permanent and the company went into liquidation in 1905. Two of their machines were purchased by the Titaghur Paper Mills, which commenced manufacture in 1884 at Titaghur with three machines. During the period 1892-94 a third paper mill known as the Imperial Paper Mills was established on the Hoogly at Kankinara. This venture however, was not successful and ultimately in 1903 the mill was taken over by the Titaghur group. For thirty years after 1892, no new mill sprang up in this area.

In 1922, the Indian Paper Pulp Co. Ltd., formed in 1819, commenced production of paper at Naihati.

3. The oldest of the up-country mills namely the Upper India Couper Paper Mills Ltd., at Lucknow, started manufacture in 1882 with one machine which was duplicated in 1894. Another single machine paper factory was installed at Gwalior in 1881, but was eventually closed down as it could not be run at a profit. In 1922, the machinery was removed to Raniganj (Bengal) and incorporated in the plant of the Bengal Paper Mills Co. Ltd.

4. In 1887 another company, the Deccan Paper Mills Co. Ltd., began the production of paper at Poona. It continued to run for over 30 years till 1924, when it had to be temporarily closed down on account of the general depression in trade. One of the most important of the up-country paper mills is situated at Raniganj and belongs to the Bengal Paper Mills Co. Ltd. This concern was floated in 1889 and started manufacture in 1891.

5. The Indian paper industry struggled hard for survival till the beginning of the World War I. During 1914-18, on account of the curtailment of imports of wood pulp, the industry experienced certain difficulties. The general depression in trade at the end of the war and the dumping of enormous quantities of foreign imports, further worsened the condition of the Indian industry, and a representation was made by the Indian Paper Makers Association, to the Government of India in

June, 1923 for assistance. Later in January, 1924, the Indian Paper Pulp Co. Ltd., asked for protective duty on imported paper. Realising the importance of paper industry and the difficulties it had been experiencing, the Government of India referred its case to the Tariff Board in 1925.

Position of the industry at the time of the first Tariff Board in 1924-25.

6. At the time of the Tariff Board enquiry in 1924-25, there were nine paper mills in India. Of these, the two Titaghur Mills and the Bengal Paper Mills at Raniganj had four machines each. The paper mills at Lucknow had two and the remaining five had one machine each. The annual production capacity of all taken together was estimated at about 33,000 tons per year. Two new mills were projected. The one at Rajahmundry (Madras) had already been partially constructed. This was owned by the Carnatic Paper Mills Ltd. and had an estimated capacity of 1,600 tons a year. The other was projected at Jagadhri (Punjab) by the Punjab Paper Mills Co. Ltd., with an estimated annual capacity of 6,000 tons.

7. In 1925 there was a revenue duty of 15% on all classes of paper. The main raw material used by the Paper mills was *sabai* grass (*Eulaliopsis binata*). The Tariff Board considered the possibilities of utilising bamboo which was so abundantly available in the country. Experiments on manufacture of bamboo pulp for paper making were very promising. It was therefore suggested by the Board that financial assistance should be offered to the mills prepared to experiment with bamboo pulp. A specific duty of 1 anna per lb. on all types of writing and printing paper, excepting chromo, marble, poster, flint, stereo and newsprint containing 65% or more of mechanical pulp was also recommended.

8. The Government of India rejected the proposal for financial assistance to mills but agreed to the imposition of protective duties on certain classes of paper. The Bamboo Paper Industry (Protection) Act was passed in September, 1925. This provided protection to printing paper (excluding chromo, marble, poster, stereo) of all sorts, containing less than 65% of mechanical pulp and to writing paper of all types including ruled and printed forms and manuscript books. The life of the act was fixed upto 31st March, 1932.

Tariff Board (1927) :—

9. The Act of 1925, did not clearly specify whether the percentage of mechanical pulp should be calculated on the net fibre content of the paper or on its total weight. This point was referred to the Tariff Board in 1927 and as a result of their recommendations an amendment was passed which provided that the percentage of mechanical pulp should be calculated on the net fibre content. The Act was also amended to provide that printing paper containing no mechanical pulp should be liable to the protective duty. In the case of ruled or printed forms (including printed letter paper), account and manuscript books and the binding thereof, if the protective duty was less than the revenue *ad valorem* duty, the *ad valorem* duty was to be levied.

The general *ad valorem* duty at that time was 15%. When the general level of revenue duty was raised from 15 to 20% by the Indian Finance Act, 1931, no change was made in the *ad valorem* protective duty of 15% imposed on writing paper as an alternative to the specific duty of 1 anna per lb. In November, 1931, the Government of India imposed a surcharge of 25% on the existing revenue and protective duties levied on different classes of paper thus raising the specific protective duty to 1 anna 3 pies per lb. and the alternative *ad valorem* duty to 18.3/4%.

Tariff Board (1931) :—

10. As the Act of 1925 was due to lapse on 31st March, 1932, the Government of India again referred the case of the Indian paper industry to the Tariff Board in 1931. By this time the industry had made satisfactory progress. The maximum annual production capacity of the Indian mills in 1931 was estimated at 45,600 tons. There was no change in the number of mills, but the Indian Paper Pulp Co.'s mill at Naihati and the Deccan Paper Mills at Poona, had added one more machine each. Of the projected mills at Rajamundry and Jagadhri (Punjab) the former was working only partially due to lack of capital; while the latter went into liquidation after working for about nine months.

11. The main recommendations of the Board were that the paper industry had justified the protection given to it and that the existing protective duties should continue for a further period of seven years. In order to encourage the development of bamboo pulp a duty of Rs. 45 per ton on imported wood pulp was also proposed. The Government of India accepted the main recommendations of the Board. The Bamboo Paper Industry (Protection) Act of 1932 provided protection for the classes of paper already protected at the existing rates but raised the percentage of mechanical wood pulp in duty free paper from 65 to 70%. A protective duty of Rs. 45 per ton was also imposed on imported pulp. All these duties were subject to the revenue surcharge imposed in November, 1931.

Some changes were made in the Tariff Schedule in consequence of the Ottawa Trade Agreement. The effect of these changes was to raise the standard rate of duty on some classes of paper subject to revenue duty to 30 per cent. with a preferential rate of duty of 20 per cent. for articles which were of British manufacture.

Tariff Board (1935) :—

12. The Tariff Board in 1931 was not satisfied with the classification of writing and printing paper and had suggested examination of the definitions according to trade conventions by a representative conference of all the interests concerned. The Government of India did not accept this proposal but finally in 1935 referred the matter of classification to the Tariff Board. The Board examined many schemes and methods of classification, but found them to be impracticable. They finally decided that the existing scheme was the best as it had the merit of being familiar to the trade and the Customs Department. The main recommendations of this Tariff Board were accepted by the Government

but it was decided to defer the necessary legislation on modifications of the Tariff Schedule.

Tariff Board (1938) :—

13. The most significant advance made by the Indian paper industry during the period 1931 to 1938 was in respect of indigenous pulp production. This was mainly due to the protective duty imposed on imported pulp by the Bamboo Paper Industry (Protection) Act of 1932. The quantity of bamboo pulp used in the Indian mills increased from 5,228 tons in 1931 to 19,281 tons in 1938, of grass pulp from 9,049 tons to 11,500 tons. The increase in pulp manufactured from other indigenous materials was from 5,992 tons to 7,919 tons. The quantity of imported pulp in the same period decreased from 20,081 tons to 10,976 tons. The proportion of imported pulp used by mills decreased from 50% to 20%.

14. The total consumption of paper including boards in India increased from 82,735 tons in 1931-32 to 113,654 tons in 1936-37. The consumption of writing and printing paper increased in the same period from 48,131 tons to 55,204 tons. The output of Indian Mills increased from 40,588 to 48,531 tons. The number of mills increased from 9 in 1931-32 to 10 in 1937-38. In 1937-38 five mills were manufacturing paper from bamboo or bamboo and grass, two from grass and three from rags and wastepaper.

15. On the expiry of the period of protection, the Government of India again referred the case of the Indian paper industry to the Tariff Board in 1938. The Board recommended that the period of protection be extended by seven years from April, 1939. The measure of protection suggested, was to be fixed at 11 pies per lb., 1 pie less than the protective duty recommended by the Tariff Board in 1931 and 4 pies less than the prevailing rate of duty which included a revenue surcharge of 3 pies. The continuance of import duty on imported pulp was recommended at the rate of Rs. 35/- per ton or 25% *ad valorem* whichever was higher. The previous rate of duty plus surcharge was Rs. 56-4-0 per ton.

16. The Government of India accepted the recommendations of the Board with slight modifications. The tariff schedule for paper imports as it stood on 31st March, 1942, is given in Appendix I attached to this report. It has recently been extended to 31st March, 1947.

Present position of the industry :—

17. The progress made by the Indian paper industry during the present war has been rather significant. Paper and board production excluding straw board has increased to 1,03,883 tons in 1944 as compared with 53,811 tons in 1937-38 (Appendix II(d)). In spite of the fact that imports of wood pulp have been appreciably curtailed during this war, the Indian industry has improved and increased production with indigenous raw materials,

A comparative statement showing the quantities of raw materials used by the paper industry in 1936-37 and 1944 is given below (*Vide* Appendix IV).

Raw Materials.	1936-37 (tons).	1944 (tons).
1. Bamboo	19,281 (pulp)	1,87,000 (bamboo)
2. Sabai grass	11,510 (,,)	60,086 (sabai grass).
3. Wastepaper	5,908	17,400
4. Old rags, cloth cuttings, hemp rope etc.	8,868	27,328
5. Imported wood pulp	10,976	

18. The number of mills has increased from 10 in 1938 to 16 in 1944 (Appendix VI). During this period, great attention has been paid by Indian paper mills to bringing their pulping and beating processes up to date, thus resulting in an all round improvement in the quality of Indian made paper. Paper machinery valued at Rs. 187.8 lakhs (Appendix V) has been imported during this period. Most of the mills have improved their pulp manufacturing plants and some of them manufacture their own requirements of caustic soda and chlorine. Production of kraft paper has been undertaken by one mill. Special types of paper e.g. blotting paper, bank paper etc., are being successfully manufactured by some Indian mills.

Consumption of paper in India:

19. In 1937-38, consumption of all types of paper in India including newsprint was estimated at 2,03,574 tons consisting of 1,49,975 tons of imports supplemented by 53,599 tons of indigenous production. Due to war conditions imports have largely diminished. During this period local production has gone up and in 1943-44 Indian mills produced 99,831 tons of paper and boards excluding straw board. Imports during the same year were about 20,000 tons. Indian production for 1944 has been estimated at about 1,03,883 tons (Appendix II(a)). Straw board production in 1944 was estimated at about 14,000 tons.

20. Consumption of printing paper excluding marble, flint, stereo etc., and writing paper was 72,086 tons in 1937-38. In 1942-43, India consumed 66,392 tons consisting of 64,850 tons of local production (Appendix II (e)) supplemented by only 1,542 tons of imports. In 1937-38 the consumption comprised of 47,798 tons of local production (Appendix II(d)) and 24,288 tons of imports (Appendix V(a)).

21. Wrapping papers including kraft, imitation kraft, manilla, oiled and waxed etc., were mostly imported before the Second World War. In 1937-38 consumption of wrapping papers in India was 29,041 tons out of which 3,521 tons were contributed by local production (Appendix II(d)). Imports were 25,520 tons valued at Rs. 83.8 lakhs (Appendix II(e)). In 1942-43 Indian production was 16,984 tons (Appendix II(e)) which was supplemented by only 2,148 tons of imports.

22. Consumption of blotting paper, other kind of paper and paper manufactures in 1937-38 was 7,902 tons. Indigenous production was 2,280 tons (Appendix II(d)). Imports were 5,622 tons (Appendix V(d)) valued at Rs. 42.6 lakhs. In 1942-43 imports were only 2,272 tons.

23. Besides the above, India was annually consuming on an average 38,000 tons of newsprint which came mainly from Sweden, Norway, Canada and United Kingdom. In 1935-36, 34,327 tons valued at Rs. 52.4 lakhs were imported. The maximum imports were in 1937-38 when 43,245 tons valued at Rs. 78.7 lakhs were imported. The imports in 1943-44 were 13,777 tons costing Rs. 45.7 lakhs. (Appendix V(b)). No newsprint has ever been manufactured in India.

24. Some quantities of litho, poster and other special types of paper were also imported into India. In 1937-38 imports were 2,486 tons valued at Rs. 8.7 lakhs.

25. Old newspapers in bales found a large market in India. They were used for packing sweetmeats, provisions and other foodstuffs. Imports were mainly from United Kingdom and U.S.A. and were on an average, 48,000 tons per year in pre-war days. In 1935-36, 57,583 tons (Appendix V(c)) valued at Rs. 41.6 lakhs were imported. In 1937-38, the imports were 48,809 tons and in 1942-43 they fell to 1,119 tons valued at Rs. 2.9 lakhs.

Paper Control :—

26. To organise production in the paper mills and to ensure continuous supplies for defence requirements, the entire production of the Indian paper mills was put under control in 1942 and a Paper Production Commissioner was appointed to enforce the control. This measure was considered necessary because imports had gone down appreciably and the entire defence requirements, which had greatly increased, had to be met from indigenous production. The control order allowed 70% of the total production for Government use, including military requirements, and the remaining for essential civilian requirements. There was an acute shortage of paper in the civil market, and universities and other educational institutions suffered in consequence. During the years 1942 and 1943, the paper problem became rather serious and arrangements were made to import large quantities of paper from America under lend-lease arrangements. Government assisted the paper mills with raw materials, coal, railway transport, etc., in order to get maximum production. In 1944, the development of paper production was taken over by the Supply Department and a separate Paper Directorate was formed. Later, conditions became steadier, and the quota for essential civil requirements has been increased to 70%.

27. During this war, the position with regard to newsprint has also been serious. From 43,245 tons imported in 1937-38, the imports decreased to 13,777 tons in 1943-44. Besides increased newspaper requirements, Government consumed a substantial quantity for publicity work. The result was an acute shortage for civilian requirements. A Newsprint Controller was appointed and strictly rationed quantities of newsprint were supplied to newspapers. Sizes of newspapers were reduced and the number of pages was decreased. A number of small newspapers and periodicals had to cease publication and a large number of printing presses were hard hit. Due to this acute shortage of paper, a large inherent demand for paper in the country has remained

unsatisfied. As normal conditions return, the Indian industry will have to meet this unsatisfied demand.

Location of present units :-

28. The principal seat of the Indian paper industry is in the Hoogly District in Bengal. It is in this area that the first paper mill was established in 1870. While Bengal produces more than 50% of the total Indian production of paper, the various mills are more or less evenly distributed throughout the country. The existing paper mills are located at the following places :—

<i>Name of Province or Indian State.</i>	<i>No. of mills.</i>	<i>Site of paper mill.</i>
1. Bengal	4	1. Kankinara. 2. Titaghur. 3. Raniganj. 4. Naihati.
2. Orissa	1	1. Brajrajnagar, (Sambhalpur Distt.)
3. Bihar	1	1. Dalmianagar (near Dehri-on-Sone).
4. Bombay	3	1. Poona. 2. Bombay. 3. Ahmedabad,
5. United Provinces	2	1. Lucknow. 2. Saharanpur.
6. Punjab	1	1. Jagadhri, (Ambala District).
7. Madras	1	1. Rajamundry.
8. Hyderabad State	1	1. Sirpur-Kaghaznagar.
9. Mysore State	1	1. Bhadravati.
10. Travancore State	1	1. Punalur.

Raw Materials.

Bamboo :—

29. The main raw materials used by the Indian paper mills are bamboo and *sabai* grass. Abundant supplies of bamboo are available in Assam, Bengal, Bihar, Orissa, Central Provinces, Mysore, Bombay, Madras, Hyderabad and Travancore. One great advantage that bamboo scores over conifers is that it is a two to five yearly crop while the soft woods take forty to sixty years before they become suitable for use as pulp wood. This assures the Indian Industry of a regular and continued supply of the basic raw material besides preserving the timber resources of the country for more important uses.

30. Of the various species of bamboo which grow abundantly in the country and have been found useful for pulp manufacture, the *etc* (Ochlandra-brandisii) variety grown in Travancore State has been found.

to be the best. Other varieties include *mili* (*Melocanna bambusoides*), *daba* (*Bambusa arundinacea*), *saliya* (*Dendrocalamus strictus*) etc. The Panel feels that the Provincial Forest Departments should make efforts to grow bamboo as a commercial crop, so that the paper industry may be assured of continuous and regular supplies.

Grass :—

31. One other indigenous raw material which has gained prominence especially in the Indian paper industry is *sabai* grass. It grows chiefly in the Punjab, the United Provinces, Bihar, Orissa and Nepal State. Experiments conducted by the United Provinces, the Punjab and Bengal Forest Departments, have established that *sabai* grass can be grown as a commercial crop on waste land. The Panel suggests that experiments should be conducted to grow other grasses and wood, suitable for making pulp, on a commercial scale.

32. Whereas it has become an established fact now, that bamboo will be the principal material for paper manufacture in India, the use of grass as a constituent for paper manufacture has recognised value. It will continue to be used in conjunction with other materials as a necessary ingredient in the manufacture of paper. It may be substituted by bamboo in certain areas, but in the United Provinces and the Punjab, where adequate supplies of bamboo are not available, *sabai* grass will continue to be the chief raw material for the paper industry.

Bagasse :—

33. Another promising material which presents bright prospects for use as pulp especially in the manufacture of cheap quality papers and boards, etc. is bagasse. In foreign countries it has been put to a variety of uses. In India large quantities of bagasse may become available with sugar mills every year which can be used for pulp manufacture.

Wood Pulp :—

34. The manufacture of wood pulp has never been attempted in this country on the ground that soft woods are not available in India at economic prices. Abundant supplies of spruce and fire wood are known to exist in the north Himalayan region (Kashmir, Tehri Garhwal and the Punjab forests). No systematic effort has ever been made by the forest departments to explore the possibilities of their economic transport to the plains and their commercial utilisation. Once this is made possible, the manufacture of both chemical and mechanical pulp suitable for either rayon or newsprint will be possible in India. The Panel strongly recommends that immediate steps should be taken in this direction.

35. Besides the above mentioned raw materials, there are abundant supplies of other cellulose bearing materials such as hemp, reeds, cotton waste, cotton linters etc. More extensive research should be carried out to explore the possibilities of their use in paper, board and other industries.

36. It can therefore be seen that India is very favourably placed with regard to the basic raw materials used for paper manufacture. Authoritative statistical data about the total quantities of these raw

materials grown in different areas is however, not available. The Panel, therefore, strongly recommends that the Government should arrange for the carrying out of an immediate survey of all cellulosic raw materials including soft and hard woods, bamboo, grass, other reeds, cotton linters, cotton wastes etc., available in the country. The survey should be carried out by the Agriculture Department, Government of India, who should appoint special officers in the different regions for collection of statistical data and should be given a special grant for this purpose. For carrying out this survey priority should be given to those regions where the location of new units is indicated by the Panel.

37. Besides bamboo and *sabai* grass, wastepaper and paper cuttings, are also used as ingredients in the manufacture of cheaper qualities of paper. Rags and cloth cuttings are utilised for superior qualities. The collection is made through contractors mainly from large towns. During 1944, the paper industry used about 17,400 tons of wastepaper, 19,950 tons of old rags, tailors cuttings etc., and 7,373 tons of hemp. (Appendix IV).

Manufacture of pulp from waste materials:—

38. The manufacture of pulp from waste materials like old rags, and wastepaper has not received as much attention in this country as it deserves. In the United Kingdom and other industrially advanced countries, the collection of waste materials is a highly organised business and scrap collection depots exist in every corner. There is a large range of recognised qualities for which regular price quotations are published. During World War II there was a mass drive for scrap collection in England. This proved very useful and many factories were fed from scrap raw materials. On a much smaller scale the same scheme was initiated in some cities in India and a number of scrap collection committees were formed and scrap depots were opened. It is suggested that in the post-war period, the scrap collection agencies and depots should be retained, as these constitute potential sources of raw materials for many industries. The entire scheme should be organised on systematic lines with the co-operation of the industries concerned.

Chemicals:—

39. The following chemicals are generally used by the paper industry:—

- | | | |
|-------------------------|----------------------|-----------------------|
| 1. Caustic soda. | 2. Magnesite. | 3. Sulphur. |
| 4. Sodium silicate. | 5. Soda ash. | 6. Hydrochloric acid. |
| 7. Sodium sulphide. | 8. Lime. | 9. Bleaching powder. |
| 10. Sulphuric acid. | 11. China clay. | 12. Rosin. |
| 13. Alum ferric. | 14. Glue. | 15. Casein. |
| 16. Starch. | 17. Dyes. | 18. Potassium ferro- |
| 19. Aluminium sulphate. | 20. Salt cake. | cyanide. |
| | 21. Sodium chloride. | |

The quantities of different chemicals used by the Indian paper industry in 1944 are given in Appendix IV attached to this report.

Power requirements :—

40. The problem of supplying cheap power for the industry is of great importance. About 3 to 4 tons of coal are needed for the manufacture of one ton of paper (pulp and paper). Most of the Indian paper mills are worked on electric power generated at the factories. In course of time some of the mills will switch on to hydroelectric power, wherever it is available, thereby effecting economy in coal consumption. The Mysore Paper Mills Ltd., in Mysore State and the Punalur Paper Mills Ltd., in Travancore State are already using hydroelectric power. The quantity of coal used by paper mills in 1944 was .345 million tons (Appendix IV). Calculating on the average basis of 3.5 tons of coal per ton of paper, it is estimated that the industry will require in 1951 and 1956, .66 million tons and 1.19 million tons of coal respectively. These quantities will appreciably decrease with the advent of cheap hydroelectric power.

Labour employed in Indian paper mills :—

41. The labour required by the Indian paper industry can be classified under two heads, the labour employed in the collection of primary materials such as bamboo and grass and the labour employed in the manufacture of pulp and paper. There appears to be no difficulty in obtaining sufficient Indian labour of either class. No figures are available as to the labour employed in the collection of raw materials as this work is mainly done through contractors. A statement giving the average number of daily workers employed by the paper industry in different years is given below :—

Years.				Average No. of daily workers employed.
1931-32	..	..	..	6,025
1933-34	..	..	..	6,141
1936-37	..	..	..	7,037
1942-43	..	..	..	15,280
1945	..	..	..	17,629

Future expansion of the industry :—

42. The per capita consumption of paper in India was only 1 lb. in 1939 as compared to 152 lbs. in U.K. and 174.4 lbs. in the United States of America in 1935 and 174.7 lbs. in Canada in 1937. The consumption of paper is largest in the U.S.A. and the per capita consumption in that country in 1941 was about 300 lbs. The low consumption of paper in India in the past can largely be attributed to the poor literacy standard. With the growth of literacy, expansion of commerce and industry and the general rise in the standard of living, the consumption of paper bids fair to increase rapidly in the future.

43. The post-war expansion of every industry in India is closely linked up with the early procurement of capital goods from abroad. Due to the complete stoppage of imports during the war and the abnormal demands of the military and other Government departments the Indian paper and board industries have been working under great stress. The result has been that most of the machines require either replacement or immediate repairs. The Panel considered a number of quotations for paper machinery received by the members from foreign manufacturers. In every case, the period of delivery quoted was not less than two to three years. Therefore the Panel feels that no new mill will be able to start production before 1950. It may however be possible for the existing mills to replace and replenish their plants within the next two or three years.

44. In view of the above difficulties, the Panel feels that the post-war development of paper and board industries should be spread over a period of ten years ending 1956, and should consist of two stages. The first stage of expansion in production should be achieved during the first five years ending 1951 and the second stage should be reached in the succeeding five years ending 1956. The Panel, therefore, recommends the following post-war consumption and production targets for the paper industry:—

Anticipated consumption.

Type of product.	Anticipated annual consumption in 1951 (tons).	Anticipated annual consumption in 1956 (tons.)
1. Writing and printing paper including art, chromo, stereo, badami etc. ..	1,25,000	2,00,000
2. Cheap wrapping paper including old newspapers	60,000	60,000
3. Kraft paper	20,000	40,000
4. Sand-paper	7,000	10,000
5. Grease-proof paper including vegetable parchment etc.	2,000	4,000
6. Miscellaneous types excluding cellophane ..	6,000	8,000
7. Newsprint	60,000	1,00,000
Total paper ..	2,80,000	4,22,000

Anticipated indigenous production:

Type of product.	App. present indigenous production (tons.)	Anticipated annual indigenous production in		Balance to be met by imports in	
		1951 (tons).	1956	1951 (tons).	1956
1. Writing and printing paper, including art, chromo, stereo, badami, etc.	75,000	1,10,000	2,00,000	15,000	<i>Nil.</i>
2. Cheap wrapping paper ..	<i>Nil.</i>	24,000	50,000	36,000	10,000
3. Kraft paper	10,000	20,000	40,000	<i>Nil.</i>	<i>Nil.</i>
4. Sand-paper ..	Very small	7,000	10,000	<i>Nil.</i>	<i>Nil.</i>
5. Grease-proof including vegetable parchment, etc. ..	<i>Nil.</i>	2,000	4,000	<i>Nil.</i>	<i>Nil.</i>
6. Miscellaneous types excluding cellophane* ..	2,500	6,000	3,000	<i>Nil.</i>	<i>Nil.</i>
7. Newsprint ..	<i>Nil.</i>	20,000	40,000	40,000	60,000
Total ..	..	1,89,000	3,52,000	91,000	70,000

*Include match paper, teleprinter, toilet, target, cigarette, tissue paper, etc.

Writing and printing paper including art, chromo, stereo, badami, etc:—

45. The Panel is of the opinion that the entire demand for writing and printing paper should be met by indigenous production. In the initial stages due to lack of special plants, technical personnel and research facilities, it may however be necessary to import about 15,000 tons per annum of special types of paper such as chromo, stereo etc.

46. To make education popular and bring it within the reach of the masses, it is necessary that the price of printing and writing paper should be brought down. The Panel therefore, recommends that the production of cheap printing and writing paper midway between the present quality and newsprint quality should be encouraged and developed.

Cheap wrapping paper including old newspapers :—

47. In the pre-war period, about 48,000 tons of baled old newspapers were imported into India every year, and found their way into the Indian markets where they were extensively used for packing sweetmeats, provisions etc. This use is most unhygienic and should be discouraged. The Panel strongly feels that Indian paper mills should be encouraged to produce cheap unbleached wrapping paper from bagasse, straw etc., to replace the imports of baled old news papers in the post-war period. It may not be possible for the Indian mills to produce the stuff at competitive rate in the initial stages. It is therefore suggested that some sort of Government help either in the form of protection or as a subsidy should be provided to encourage the production of cheap wrapping paper. Further research work on this problem should also be undertaken at the proposed research centre at Dehra Dun.

Kraft paper :—

48. Kraft paper is a packing paper of special strength manufactured by the sulphate process. Before the war kraft paper was mainly imported from Scandinavian countries. In 1937-38 imports amounted to 13,804 tons valued at Rs. 39 lakhs (Appendix V(e)). During the present war, the Orient Paper Mills have started the production of kraft paper. The Panel is of the opinion that kraft paper of the imported quality can be successfully manufactured in India. During the next ten years additional production of 30,000 tons of kraft paper annually is recommended.

Sand-paper :—

49. In the pre-war days sand-paper was imported partly from United Kingdom but mainly from Italy. With the general development of industries, consumption of sand-paper is bound to increase. At present there are a few small factories producing sand-paper in India, with estimated total daily capacity of about 8 tons of the finished product.

Grease proof paper including vegetable parchment etc. :—

50. Before the war grease proof paper was all imported from abroad. Imports in 1938-39 were 1,319 tons value at 5.5 lakhs. The demand for this class of paper is bound to increase in the post-war period and steps should therefore be taken to develop its manufacture.

Miscellaneous types excluding cellophane :—

51. This class includes such papers as match paper, teleprinter, toilet, target, blotting, cigarette, tissue etc. Certain quantities of blotting paper have been manufactured in the country. The Panel is of the opinion that the manufacture of these types of paper should be undertaken as adjuncts to existing or proposed factories.

Newsprint :—

52. The Panel strongly feels that it is most essential that India should not remain dependent upon foreign supplies for newsprint, which is a vital commodity of national importance. Due to the stoppage of imports during this war, there was an acute shortage of newsprint in

the country. Even with the cessation of hostilities the position has not improved. It is learnt that a mission on behalf of the Indian newspapers and with the co-operation of the Government of India has gone to England, U.S.A. and Canada to arrange for newsprint supplies for India. The Panel considers this to be an extremely unsatisfactory state of affairs, especially when the basic raw materials *i.e.*, the soft woods are abundantly available in the Tehri Garhwal, Kashmir and the Punjab forests. If a serious attempt is made by the Government to explore the possibilities of their commercial exploitation and economic transport to the sites of the factories in the plains, the problem of newsprint manufacture can be successfully solved. The Panel feels that it may be necessary for the Government to offer some sort of subsidy, in the initial stages, for the development of this industry. It is hoped that private enterprise will be coming forward to take up this industry provided Government assistance and help either in the form of subsidy or protection is assured. The Panel however feels that in case private capital is not forthcoming to start this industry, the Government should themselves take up newsprint manufacture in the immediate post-war period. With the rise in literacy in the post-war period the demand for newspapers is bound to increase. The Panel visualises an increase of about 60,000 tons per annum over the pre-war annual imports which amounted to about 38,000 tons (Appendix V(b)), during the first ten post-war years. It is interesting to note that the Sirpur Paper Mills, Hyderabad have successfully experimented upon the use of a locally available wood for newsprint manufacture and are now planning to instal a newsprint mill.

Future location of the industry:—

53. For the successful working of any industrial venture the selection of a suitable site is of primary importance. For paper and board mills the selection of a site is influenced principally by the following factors:—

- (i) Availability of raw materials.
- (ii) Cheap power and cheap fuel.
- (iii) Abundant supply of water (approximately 1,00,000 gallons of clean, fresh and soft water are required for 1 ton of paper).
- (iv) Transport facilities.
- (v) Availability of cheap and efficient labour.
- (vi) Proximity to consuming markets.

54. Regionalisation of industry is the watchword of economic planning. Undue concentration of industry is undesirable as much from the point of view of balanced and planned economic development as for strategical reasons. In view of the fact that Bengal produces more than 50% of the total paper produced in the country, the Panel is of the opinion that the setting up of new paper mills or expansion of the existing mills to manufacture the same varieties of paper as are being produced there now should be discouraged.

55. Regarding location of new units for different varieties of paper the Panel makes the following recommendations:—

(a) Writing and printing paper including cheap quality writing and printing paper as mentioned in paragraph 46.

One economic unit each with annual production capacity of 8,000 tons for the following Provinces and States:—

- | | | |
|------------|--------------------------------------|---------------------------------|
| 1. Madras. | 2. Bombay. | 3. Assam. |
| 4. Punjab. | 5. United Provinces. | 6. Central Provinces and Berar. |
| 7. Bihar. | 8. Central India State. | 9. Rewa State. |
| | 10. Eastern States Agency or Orissa. | |

(b) *Cheap wrapping paper*:—6 units each of 5,000 tons annual production capacity producing light weight cheap wrapping paper and 2 units each of 10,000 tons annual production capacity producing heavy weight cheap wrapping paper.

One unit each for the following Provinces and States:—

- | | | |
|----------------------|---------------------------------|------------|
| 1. United Provinces. | 2. Bihar. | 3. Bengal. |
| 4. Bombay. | 5. Madras. | 6. Sind. |
| 7. Punjab. | 8. Central Provinces and Berar. | |

(c) *Kraft paper*:—

One unit each of 10,000 tons annual production capacity for the following Provinces and States:—

- | | | |
|------------|---------------------------------|------------|
| 1. Bombay. | 2. Central Provinces and Berar. | 3. Orissa. |
|------------|---------------------------------|------------|

(d) *Newsprint*:—

An economic unit is one producing 20,000 tons of newsprint per year.

Newsprint mills can with advantage be located in the following Provinces and States:—

- | | |
|---|-----------------------------|
| 1. Hyderabad State. | 2. Punjab or Kashmir State. |
| 3. United Provinces or Tehri Garhwal State. | |

Sizes of units:—

56. The Panel is of the opinion that a minimum economic unit, under Indian conditions for manufacturing ordinary classes of paper is one producing 8,000 tons of paper per annum. It is therefore felt that existing paper mills below this capacity should be encouraged to expand their production to this figure. The Panel recommends that 40,000 to 50,000 tons of the projected expansion of paper other than newsprint should be allocated for the expansion of the existing mills and the remaining for new mills.

Future requirements of chemicals:—

57. The quantities of different chemicals which will be required by the Indian paper industry in 1951 and 1956 are given in Appendix III attached to this report,

Capital goods requirements :—

58. To meet large war and essential civilian demands, the Indian paper and board industries have, during the present war, been working under great stress and strain. Production has been raised by working the factories overtime and over capacity. This has resulted in the wearing out of most of the machines, which require immediate replacement. Besides, new plants are needed to meet increased post-war requirements. Plants for pulp and paper manufacture incorporating the latest improvements will be required by the paper mills. The Panel, therefore, strongly urges upon the Government to grant all facilities for the early import of capital goods for these industries. At present the choice of the Indian buyers is restricted to British manufacturers only, who are quoting high prices. The Panel also feels that as long as the present restrictions on exchange prevail, it may not be an easy affair for the Indian industrialists to obtain supplies of capital goods from the United States of America and other countries and therefore the Panel wishes to urge upon the Government the necessity of relaxing these restrictions at as early a date as possible in order that plants and equipment may be obtained in free and competitive market.

59. Calculating on the basis of prevailing quotations for machinery, the Panel is of the opinion that capital goods worth about Rs. 10 crores will be required by the Indian paper and board industries during the next five-year period.

60. The Panel recommends that the prospects of manufacturing paper, pulp and board machinery in India should be thoroughly explored and attempts should be made to manufacture these in the country. Costs of production in mills have gone up considerably and the continuity of operations has been jeopardised owing to difficulties in obtaining essential stores and spare parts such as, felts, machine wires, carbon rods, rolls, etc. Dependence on external sources for the supply of these essential materials should be minimised and ultimately eliminated. In planning a large scale development of the Paper Industry, it seems essential that due regard is paid to the development of subsidiary industries which ensure a steady supply of these stores and spares which are so essential for maintenance. Even though we will have to depend for some time to come on foreign countries for procuring the capital goods and equipment required for the expansion of existing mills and erection of new ones, dependence on other countries for supplies of simple but essential stores and spares like those enumerated above is a reproach as well as a weakness which we should lose no time to remedy.

Protection :—

61. The Panel is of the opinion that protection to paper industry will be necessary to safeguard the industry against keen foreign competition in the post-war period. Owing to unsettled conditions in foreign countries and shipping difficulties, foreign competition in paper industry is practically non-existent at the present moment. It is however quite possible that in the near future when normal conditions revert and

peace time production abroad is well advanced, foreign countries particularly U.K., Norway and Sweden will endeavour to capture their pre-war export markets including India. Owing to several factors such as higher prices of raw materials, chemicals, machinery, stores etc., higher transport charges, comparatively lower efficiency of Indian mills, smaller sizes of units etc., it may not be possible for the industry to effectively compete in the initial stages with foreign products. The Panel therefore recommends that the present protection afforded to the Indian paper industry should be continued and the scope of protection should be extended so as to include varieties of paper and boards that remain unprotected at present. The degree and form of protection for different classes of paper and boards should be reviewed by the Tariff Board at an early date. This measure will not only create confidence in the minds of the existing millowners but will provide an incentive for the prospective industrialists who wish to start these industries.

Government assistance:—

62. To assist the growth of the industry, the Panel is of the opinion that the Government should adopt a favourable railway rates policy by extending concessions in the freight for the movement of raw materials required by the industry and of the finished products.

Ownership of industry:—

63. The Panel is of the opinion that the paper and board industries should be owned by private enterprise except in the case of news-print manufacture, where it is suggested that the Government should themselves take up the project in case private capital is not forthcoming in spite of Government subsidy or any other form of assistance. The Panel feels that the entire capital required for the expansion of these industries will be available from the public and no financial assistance from the Government will be needed.

64. The Panel is of the opinion that no foreign co-operation both as regards capital and management is necessary for these industries. Foreign technical advice and skill will be required on short-term contract basis for the development of special types of paper such as teleprinter, toilet, match, cigarette, tissue etc.

Possibility of using bamboo pulp for rayon manufacture:—

65. The Rayon Panel has recommended the early establishment of six or seven rayon factories producing 60 to 70 tons of rayon yarn per day. The Rayon Panel feels that bamboo pulp of certain special specifications can be successfully used for the manufacture of rayon. The technical details of the process have not yet been worked out and considerable research is required to standardise the pulp. If this problem is successfully solved, the Indian paper and pulp industry can help the rayon factories by manufacturing the pulp for rayon. The Panel is of the opinion that it will be distinctly advantageous and economical for the Indian rayon industry to obtain their requirements of pulp from the paper and pulp mills provided the locations of the two factories can be suitably adjusted.

Possibility of developing export trade in bamboo pulp:—

66. The possibility of exporting bamboo pulp was not explored in the pre-war days as Indian mills were not able to produce sufficient pulp to meet their own requirements. The position has changed now. A material reduction has been made in the cost of production of bamboo pulp and the world prices of wood pulp have risen to a level at which there is a possibility of bamboo pulp competing with it favourably. A market for Indian bamboo pulp can be created in the neighbouring countries such as Afghanistan, Australia, Ceylon, Egypt, South East Asia etc. The Panel however feels that export trade should only be allowed after the requirements of the Indian factories are completely met with from indigenous production.

Specialisation and efficiency controls:—

67. The Panel is of the opinion that rationalisation and specialisation in specific products by paper mills is bound to result in increased efficiency and low cost of production. Measures should also be taken for control of scientific and technical efficiency in mills as the existence of inefficient and economic units is prejudicial to the sound development of the industry. It is understood that the Paper Pulp Section of the Forest Research Institute, Dehra Dun have, already taken steps in this direction and an advisory committee consisting of representatives of the trade and Government nominees has been formed. This committee should be reorganised in conformity with the recommendations made in paragraph 70 of this report. The standardisation of products of the paper and board industries is very essential and as far as possible uniform standards for the different varieties should be maintained over the entire industry in the country.

Hand-made paper:—

68. The hand-made paper industry has existed in India for centuries. Before the advent of machine made paper, it was a flourishing trade and was the hereditary monopoly of a large number of families in many parts of the country. The superior and cheap machine made paper gave it a great set back, and during the course of the last fifty years the industry has gradually faded out. The present methods of production are primitive. The raw materials used are mainly wastepaper and to a small extent hemp, jute, etc.

69. In an agricultural country like India where there is a forced period of unemployment for the farmers, the establishment of cottage industries is essential. The Panel has carefully considered the question of developing the hand-made paper industry and is of the opinion that the production of hand-made paper in India should be expanded by organising the industry on systematic lines for the manufacture of special types of paper e.g., filter paper, currency paper, document paper, etc. The crude methods now used, should be improved by introducing semi-mechanisation in the process of manufacture. The Provincial Governments should organise special centres for training and provide machines suitable for the purpose on easy terms of payment. They may also purchase

a portion of their requirements of paper from this industry. This will provide an impetus to the industry and more people will be drawn into the trade.

Research:—

70. It is an established fact that the development and expansion of any industry depends upon efficient economic and scientific research. Many important technical problems of the paper industry have been successfully investigated at the Paper Pulp Section of the Forest Research Institute, Dehra Dun. The Panel feels that the staff and budget at its disposal is wholly inadequate to tackle larger research problems of the industry. The Panel, therefore, strongly recommends that this Research Section should be reorganised into a Pulp and Paper Research Centre at the Forest Research Institute. Fundamental and technical research connected with pulp, paper and board industries should be undertaken at this Centre and the utilisation of pulp for other consuming industries such as rayon, plastics, explosives, etc., should be undertaken at another suitable Centre. Both the Centres should however be under common advisory control. This should also serve as a training centre for training superior technical personnel for the paper and board mills. It is suggested that complete statistics regarding production, availability of raw materials etc. should be maintained at the Dehra Dun Centre. An economic and statistical section under a capable officer will also be essential. The entire scheme should be worked out by a committee of experts. The Panel recommends that a sum of Rs. 20 lakhs should be allocated by the Government towards the capital cost of the Dehra Dun Centre. The Panel feels that the recurring budget of this Centre should be shared by the Government and the industry. A statutory committee as mentioned in paragraph 72 consisting of representatives of Government and Industry should be constituted to guide the work and progress of the proposed Centres.

Technical training:—

71. The need for having qualified technical personnel cannot be denied. The Panel strongly recommends that in addition to the technicians trained at the proposed Dehra Dun Centre, the Government should send abroad a number of young Indians (at least six) every year for higher training in pulp, paper and board technology.

Statutory committee:—

72. In order to foster the growth and development of the Indian paper and board industries a statutory committee on the same lines as the Indian Central Cotton Committee should be constituted.

Industrial delegation:—

73. The Panel recommends that the Government should afford all facilities to a delegation of industrialists, connected with the Indian paper and board industries, for visiting foreign countries to study the latest developments.

Board Manufacture.

74. Boards are largely used for packing. In the pre-war days more than 70% of the board consumption in India was utilised by the textile industry. The shoe industry took up a major share of the remaining consumption. Packing of cigarettes, medicines, hair oils, toilet requisites, etc., constituted other important uses. In almost every type of packing, boards in one form or the other make their use indispensable. Special types of boards known as ammunition boards are finding increasing use in the manufacture of cartridge washers.

Consumption of boards in India:—

75. Board manufacture was unknown in this country till about 1932, when the first straw-board factory commenced production in Saharanpur (U.P.). Before 1932 India's entire demands of boards were being met by imports. Total imports in 1930-31 were 15,423 tons valued at Rs. 26 lakhs. In 1934-35 the imports increased to 20,847 tons valued at Rs. 33 lakhs, (Appendix VII). In 1937-38, imports were 31,683 tons valued at Rs. 55 lakhs. In 1942-43 due to war conditions the imports fell to 2,655 tons valued at Rs. 17 lakhs. The imports of straw-board were 11,910 tons in 1930-31, and 17,044 tons in 1937-38. Other types of boards were 3,260 tons in 1930-31, and 13,462 tons in 1937-38. Manufacture of boxes, etc. from boards totalled 253 tons in 1930-31 and 1,177 in 1937-38.

76. Paste-boards, mill boards and other boards of all sorts are subject to a revenue duty of 30 per cent. *ad valorem* with a preferential rate of 25% for British manufacture. Imports were mainly from Sweden, Germany, Netherlands, United Kingdom, Finland, Austria, Norway and Belgium. Straw-board is subject to a revenue duty of 20% *ad valorem*. Imports were mainly from Japan and the Netherlands.

Board production in India.*Straw-board:—*

77. Through the pioneering efforts of an enterprising Punjab industrialist, the first straw-board factory known as the Punjab Straw-Board Manufacturing Co. was started at Saharanpur (U.P.) in 1930. Actual production commenced in 1932. The plant imported was of German make. In the early stages numerous difficulties were encountered, the chief being the keen competition with cheap Japanese straw-board which was being sold at Rs. 4-6-0 per cwt., at Indian ports. It was however possible for the Indian manufacturers to compete with the Japanese product at the ports, although the margin of profit earned was very low in the initial stages. The Saharanpur factory passed through hard times but managed to keep up its existence. Steadily cutting down production costs and utilising cheaper raw materials, the production was increased and in 1941 maximum production of 5,600 tons was reached. The Indian product was well received in the market and was in all respects superior to the imported variety. The local production of straw-board in 1937 was about 8,000 tons. The Saharanpur factory produced 4,321 tons and the other two small mills in Bengal about 3,500 tons.

78. The success of the Saharanpur concern led other industrialists into the trade and a number of board mills were established in the country. The important factories manufacturing straw-board are :—

1. Punjab Straw-Board Manufacturing Co., Saharanpur.
2. Straw Products, Bhopal.
3. Jaswant Straw-Board Mills, Meerut.

A number of small factories such as the straw-board mills in Billimora (Bombay) and in Rewa State are also manufacturing small quantities of straw-board.

Other boards :—

79. Besides straw-board, other qualities of boards such as duplex, triplex, card, ticket etc. are also manufactured in the country. Messrs. Rohtas Industries, Dalmianagar (Bihar) are the largest producers of other quality boards. They have a plant with an annual production capacity of 10,000 tons. The Orient Paper Mills in Orissa and the Upper India Couper Paper Mills at Lucknow also manufacture boards, the latter specialise in the manufacture of corrugated and paste-boards. A number of other smaller factories manufacturing boards have also sprung up during this war but their production is insignificant.

80. The total present potential capacity of all the board mills in India is about 48,000 tons per annum (Appendix VIII). A number of the existing board mills have locally fabricated plants which are also uneconomic units. It therefore seems very doubtful if these mills will be able to withstand competition in the post-war period. The chief centres of board consumption in India are Calcutta, Bombay, Ahmedabad, Agra, Cawnpore and Delhi.

Raw materials :—

81. - The chief raw material for straw-board is wheat straw although bagasse and rice husks have also been used with advantage. Other types of boards such as cardboard, duplex, triplex and glazed boards etc., require higher percentages of cellulose. Old rags, jute waste, hemp, wastepaper, etc. are the common raw materials used for their manufacture. As has been stressed before, India abounds in cellulose-bearing raw materials and the Panel therefore anticipates no difficulty regarding the availability of raw materials for the board industry.

Power requirements :—

82. Both power and steam are required for board manufacture. It is estimated that on an average $\frac{3}{4}$ to 1 ton of coal is required for 1 ton of straw-board and 2 to 3 tons of coal for 1 ton of other board. The straw-board industry will require 37,500 tons of coal in 1951 and 60,000 tons in 1956. Similarly the other board industry will require 62,000 tons in 1951 and 97,500 tons in 1956. With the advent of cheap hydroelectric power these quantities will be considerably less.

Future expansion of the industry :—

83. Following the same arguments as have been advocated for the paper industry (paragraphs 43 and 44) the Panel recommends the following consumption and production targets for the Indian board industry :—

Type of product.	Anticipated annual consumption in 1951 (tons).	Anticipated annual consumption in 1956 (tons).
1. Straw-board	50,000	80,000
2. Duplex, Triplex and other types of boards	20,000	30,000
3. Insulating and pressed boards	3,000	5,000
4. Moulded products of boards	1,000	2,000
5. Jointing boards	1,000	2,000
Total boards	75,000	1,19,000

	Present annual effective production capacity (tons).	Anticipated indigenous production in		Imports in	
		1951	1956	1951	1956
Straw-board ..	24,000	50,000	80,000	Nil.	Nil.
Other boards ..	18,000	25,000	39,000	Nil.	Nil.

Location of new factories :—

84. Regarding location of new board mills the Panel makes the following recommendations :—

(a) Straw-board :—

One mill each in the following Provinces and States :—

- | | |
|------------|---------------------------------|
| 1. Bombay. | 2. Bengal near (Calcutta). |
| 3. Orissa. | 4. Sind. |
| 5. Punjab. | 6. Central Provinces and Berar. |
| 7. Madras. | 8. Hyderabad State. |

(b) Other boards :—

One mill each in the following Provinces :—

- | | | |
|------------|----------------------|-----------|
| 1. Bombay. | 2. United Provinces. | 3. Bihar. |
|------------|----------------------|-----------|

85. The Panel recommends that (1) the production of corrugated boards should be started as an adjunct to existing board mills (2) insulating and pressed boards should be produced in conjunction with sugar mills in the United Provinces and Bihar (3) the production of moulded products from pulp such as paper cups, dishes etc., should be started near large cities like Calcutta, Bombay, Madras and Delhi.

86. The Panel considers that a factory producing 6,000 tons of ordinary types of boards such as straw-board duplex, triplex, etc. per year is an economic unit under Indian conditions. Existing factories below this capacity should be encouraged to expand their production to this figure.

Prospects of establishing export trade:—

87. The Panel is of the opinion that there are extremely bright prospects of creating an export trade in straw-board during the post-war period. The abundance and cheapness of raw materials and labour add weight to this argument. It may be possible to export straw-board profitably to the neighbouring countries like Afghanistan, Egypt, Ceylon, Burma, Persia, etc., and compete favourably with foreign products. In this connection, the question of locating a few factories near the ports should be kept in view.

PART II.

Chemical Cotton.

88. Chemical cotton means cotton pulp. Cotton is the richest source of cellulose in nature. The cellulose content in chemical cotton is about 98%. Chemical cotton is generally used in processes where a higher percentage of cellulose is required. Staple cotton which is used in textile manufacture is a costly material to be used for cotton pulp. In view of the fact that cellulose finds use in such a large number of essential industries, cheaper sources of cellulose pulp were developed. Wood pulp has been utilised to a large extent, but on account of the low grade of cellulose obtained from this base and its unsuitability for various processes, cheaper sources of cotton have been tapped.

Cotton linters :—

89. Cotton linters, which are the short fibres left on the seed after the long cotton fibres have been removed by the ginning process, have been found to be good sources for the production of cheap chemical cotton. Though short in length, they are as pure as long cotton fibres so far as their cellulosic content is concerned.

Development of cotton linter industry in the U.S.A. :—

90. America is the largest producer of cotton linters. The first use for cotton linters in the U.S.A. was as stuffing material for mattresses, cushions and upholstery. The development of the nitro-cellulose industry made the American chemist interested in cotton linters for use as the cellulose base. Need for tremendous quantities of smokeless powder for World War I accelerated the use of cotton linters in the chemical industry. When the United States entered the war, orders were issued governing the cutting of cotton linters and the entire quantity was requisitioned for war purposes. Cotton linter production rose from approximately 0.4 million bales (1 bale is 500 lbs.) in 1910 to 1.3 million bales in 1916 and continued at a million bale level until after cessation of hostilities, when the market for nitro-cellulose explosives collapsed. Enormous quantities of linters of varying quality and little peacetime value were then available. The production of cotton linters in the U.S.A. in the different years was as under :

	(In million bales 1 bale—500-lbs.)				
	1910	1916	1920	1930	1940
Total cotton (lint fibre) ..	12.0	11.5	13.0	14.0	12.0
Total raw cotton linters ..	0.4	1.3	0.44	1.0	1.5
Raw cotton linters used for chemical industries ..				0.5	0.8

91. After World War I new industries using cellulose bases, such as plastics, rayon, lacquers, commercial explosives advanced rapidly. Because of their high purity and low cost, purified cotton linters were soon

used in increasing quantities in these industries. From 1937 onwards the chemical industry consumed more than 50% of the cotton linter production in the United States of America.

Grades of cotton linters :—

92. Cotton linters are removed from the cotton seed by delinting machines and saw gins. There are usually three grades of cotton linters, (1) first cuts (2) second cuts (3) mill runs. First cuts range from 20 to 75 lbs. per ton of the seed and because of their long staple strength are used in the manufacture of surgical dressings, gauze bandages, absorbent cotton, mattresses, ropes etc. Second cuts range from about 100 lbs. to 200 lbs. per ton of seed. The lower grades of mill cuts are used as stuffing materials for mattresses and for chemical cotton.

A fourth type of cotton linters made its appearance due to the active demand of cheap cellulose for chemical industries. There is a small amount of fuzz attached to the seed coat or hull when the seeds are decorticated and the kernels and hulls are separated. This fibre known as the hull fibre is removed by special machines and utilised for chemical manufacture.

93. The need for standardising cotton linters was keenly felt in the U.S.A. because of the varied and growing uses of cotton linters. The U.S.A. Department of Agriculture undertook this work and in 1924 fixed seven tentative grades of linters based chiefly on the different blends of the long and the short fibres contained in the linters. These grades were later accepted by the Inter State Cotton Seed Crushers Association and up to this day only graded linters are sold in American markets.

Possibilities of manufacturing chemical cotton in India :—

94. India is one of the major cotton growing countries of the world. The total amount of raw cotton produced in the country in 1943-44 was 5,072 thousand bales of 400 lbs. each. Besides short staple cotton, which is mainly grown in India, we are importing substantial quantities of long staple cotton from Egypt and America for superior varieties of textiles. Our short staple cotton which is considered unsuitable by our textile manufacturers is purchased at amazingly cheap prices by England, Japan and other industrially advanced countries. Besides short staple cotton, large quantities of cotton waste are also exported. These countries convert this cheap cotton into chemical cotton and manufacture varied types of materials which are sold to us in the form of consumer goods. Total exports of raw cotton and cotton waste in 1941-42 amounted to 0.25 and 0.04 million tons respectively.

95. The production of linters was practically unknown in this country upto 1936. The production of ungraded linters developed to a certain extent in the subsequent years. A few ginning factories and cotton seed oil companies including Messrs. Govindram Seksaria Oil Mills, Hyderabad, Messrs. Volkart United Press Co., Mirpurkhas, Messrs. B.C.C.A. (Punjab) Ltd., Khanewal, and Birla Cotton Factory, Okara, have installed saw gins and are producing ungraded cotton linters.

It is believed that a few years back several thousand bales of cotton linters were lying at Karachi port for want of buyers. This lack of demand can possibly be attributed to their being ungraded. To create a demand for this material for the chemical industries and to produce supplies suitable for their requirements, it is necessary that steps should be taken to encourage the production of linters and to standardise the Indian linters in different grades on the same lines as has been done in America. There is a potential demand for cotton linters and chemical cotton in the world. It is possible that if the manufacture of chemical cotton is started in India, we may be able to capture an export market for it. Besides export, establishment of different industries such as rayon, plastics, explosives, raw films, lacquers etc. is being planned. It is therefore only natural that we should start the manufacture of chemical cotton which is a raw material for so many important industries in India in the post-war period.

96. The actual production of linters before the war was estimated at about 15,000 bales of 400 lbs. each. This production was however far short of the potential supply as large quantities of cotton seeds were not delinted. It is difficult to make an accurate estimate of the total potential production of linters in India, but it is estimated, even if a fairly large proportion of the linter bearing seeds of the Indian varieties were delinted, about 75,000 bales of linters representing about 30 million lbs. will be available annually. The Panel very strongly recommends that early steps should be taken to make a survey of the potential supply of Indian linters and every assistance should be given by the Government, for the installation of delinting plants at the oil mills and other centres for extracting linters from seeds before they are either pressed for oil or exported out of India. In this way only a valuable raw material will be available for the development of several important industries such as explosives, rayon, plastics, lacquers etc., in India in which linters are used as the basis material, but also the cultivators of cotton will be able to get a little higher price for their seeds.

97. The Panel recommends that five million lbs. of chemical cotton should be manufactured in the country per year during the next five year period. The fact that chemical cotton is only a raw material for other industries should however not be ignored. The establishment of the latter should therefore precede the establishment of chemical cotton manufacture in India.

SUMMARY OF RECOMMENDATIONS.

The Panel recommends the following consumption and production targets for the paper and board industries for the next five and ten year periods :—

Type of product.	Anticipated annual consumption in		Anticipated annual indigenous production in	
	1951	1956	1951	1956
	(tons).		(tons).	
1. All types of paper including newsprint ..	2,80,000	4,22,000	1,89,000	3,52,000
2. All types of boards including straw-board ..	75,000	1,19,000	75,000	1,19,000

2. The Panel recommends that the Government should arrange for the carrying out of an immediate and comprehensive survey of all cellulosic raw materials including soft and hard woods, bamboo, grass, other reeds, cotton linters, cotton wastes, etc., available in the country. The survey should be carried out through the Agriculture Department, Government of India.

3. Regarding location of new units for different types of paper and boards the Panel makes the following recommendations :—

(a) *Writing and printing paper including cheap quality writing and printing paper as mentioned in paragraph 46 of the report.*

One economic unit each with annual production capacity of 8,000 tons for the following Provinces and States :—

- | | | |
|------------|--------------------------------------|---------------------------------|
| 1. Madras. | 2. Bombay. | 3. Assam. |
| 4. Punjab. | 5. United Provinces. | 6. Central Provinces and Berar. |
| 7. Bihar. | 8. Central India States. | 9. Rewa State. |
| | 10. Eastern States Agency or Orissa. | |

(b) *Cheap wrapping paper :—*

6 units each of 5,000 tons annual production capacity producing light weight cheap wrapping paper and 2 units each of 10,000 tons annual production capacity producing heavy weight cheap wrapping paper.

One unit each for the following Provinces and States :—

- | | | |
|----------------------|---------------------------------|------------|
| 1. United Provinces. | 2. Bihar. | 3. Bengal. |
| 4. Bombay. | 5. Madras. | 6. Sind. |
| 7. Punjab. | 8. Central Provinces and Berar. | |

(c) *Kraft paper :—*

One unit each of 10,000 tons annual production capacity for the following Provinces and States :—

- | | | |
|------------|---------------------------------|------------|
| 1. Bombay. | 2. Central Provinces and Berar, | 3. Orissa. |
|------------|---------------------------------|------------|

(d) *Newsprint* :—

An economic unit is one producing 20,000 tons of newsprint per annum. Newsprint mills can with advantage be located in the following Provinces and States :—

1. Hyderabad State.
2. Punjab or Kashmir State.
3. United Provinces or Tehri Garhwal State.

(e) *Straw-board* :—

One mill each in the following Provinces and States :—

1. Bombay.
2. Bengal (near Calcutta)
3. Orissa.
4. Sind.
5. Punjab.
6. Central Provinces and Berar.
7. Madras.
8. Hyderabad State.

(f) *Other boards* :—

One mill each in the following Provinces :—

1. Bombay.
2. United Provinces.
3. Bihar.

4. The Panel considers that a minimum economic unit under Indian conditions, for producing ordinary classes of paper is one producing 8,000 tons of paper per annum and for producing ordinary types of boards such as straw-board, duplex, triplex, etc. 6,000 tons per annum. Existing mills below these capacities should be encouraged to expand their production to the above figures.

5. In view of the fact that Bengal produces more than 50 per cent. of the total paper produced in the country, the Panel is of the opinion that new paper mills and the expansion of production by the existing mills for the production of same varieties of paper as are being produced there now should be discouraged.

6. Calculating on the basis of prevailing quotations for machinery, the Panel is of the opinion that capital goods worth about Rs. 10 crores will be required by the Indian paper and board industries during the next five year period.

7. The Panel recommends that the prospects of manufacturing paper pulp and board machinery and other essential stores and spare parts such as felts, machine wires, carbon rods, etc. in India should be thoroughly explored.

8. The Panel recommends that the present protection afforded to the paper industry should be continued, and the scope of protection should be extended so as to include varieties of paper and boards that remain unprotected at present. The degree and form of protection for different classes of paper and boards should be reviewed by the Tariff Board at an early date.

9. The Panel feels that the Indian paper and pulp industry can with advantage manufacture bamboo pulp for the rayon industry. Considerable research work has however to be carried out to standardise the specifications of bamboo pulp which will be suitable for rayon manufacture

10. The Panel feels that the production of hand-made paper should be expanded by organising the industry on systematic lines for the manufacture of special types of paper e.g. filter paper, bank paper, document paper, etc. The Provincial Governments should organise special centres for training and purchase a portion of their requirements of paper from this industry. Semi-mechanisation of some of the processes is also essential.

11. It is strongly felt that India should not remain dependent upon foreign supplies for newsprint which is a vital commodity of national importance. The Panel is therefore of the opinion that the establishment of newsprint manufacture in India during the post-war period is essential. In case private capital is not forthcoming to start this industry, the Government should themselves take up newsprint manufacture in the immediate post-war period.

12. The Panel strongly recommends that the Paper Pulp Section of the Forest Research Institute, Dehra Dun should be reorganised and enlarged into a Pulp and Paper Research Centre, for carrying out fundamental and technical research connected with pulp, paper and board industries. A sum of Rs. 20 lakhs should be allocated by the Government towards the capital cost of the proposed Centre.

13. The Panel recommends that six young Indians should be sent abroad every year by the Government for higher training in the pulp, paper and board technology.

14. In order to foster the growth and development of the Indian paper and board industries a statutory committee on the same lines as the Indian Central Cotton Committee should be constituted.

15. The Panel feels that there are bright prospects of creating an export trade in straw-board during the post-war period.

16. The Panel recommends that five million lbs. of chemical cotton should be manufactured in the country per year during the next five year period. The fact that chemical cotton is only a raw material for various industries such as explosives, rayon, plastics, lacquers, etc. should however not be ignored. The establishment of the latter should therefore precede the establishment of chemical cotton manufacture in India

M. L. Narasimiengar	Chairman.
G. P. Birla	} Members.
M. P. Bhargava	..	..
E. Schoenberg	..	..
Jagraj*	..	..
K. Nizamuddin	..	..
C. D. Thakkar	} Secretary.
A. S. Bhatnagar	..	..

* Subject to Mr. Jagraj's separate minute of dissent on the subject of Protection covered by paragraph 61 of the report.

MINUTE OF DISSENT TO THE REPORT OF THE PAPER PANEL, 1946.

By

Mr. Jagraj.

I disagree with the necessity of continuing protection to the Paper Industry as protection has already been given for the long period of 20 years now.

India possesses vast raw materials and when the members met the representatives of the Provinces and the States, they were told that every Province and State has the necessary raw material and desired that the Panel should allocate the erection of 1 or more mills in their respective territories and when during discussion some of them were informed that no allocation for erection of mill has been made in any Province or state, their representatives felt very disappointed and pleaded for a change in the recommendation.

In some cases there was vagueness about the idea of the availability of suitable raw materials or the idea what quantity constituted an abundant supply of raw material but we all know:—

(a) that vegetable fibres are a perennial source of raw material for the paper and pulp industry.

(b) that vegetation flourishes where there is plenty of moisture and where there is plenty of heat.

* In India there are large areas with plentiful rainfall and enough heat to help the growth of vegetation and where in such areas at present proper paper or board making quality of either grasses or woods is not grown, they can be grown by planned plantation. It should not be understood that at present there is any paucity of raw material only because quantitative or qualitative surveys have not been made. The members of the Panel generally were in agreement that raw material was abundant except for certain qualities of kraft and news print paper where there was some divergence in views.

There is no dearth of raw materials other than fibres, like coal, chemicals, fillers or power and with such a position coupled with the existence of a large home market there should be no justification for continuing the 20 year-old protection.

If Industry is left on its own after 20 years of protection, it will soon exert itself to get into efficient production and if an industry cannot live without protection after 20 years, it is not fit to live.

In the report of the Indian Industrial Commission it was advocated:—

- (1) Nurse the baby;
- (2) Protect the child; and
- (3) Free the adult.

After 20 years the Paper Industry cannot be said to be either a baby or a child. It is now fully grown adult and if it cannot survive unprotected even now, it is certainly an unhealthy adult and not fit to survive.

India will have strong and healthy industries only if industries have to fight the battle of life and spoon-fed babies cannot grow to full stature. Kindly look to the allied line of straw-board manufacture. It had a healthy growth without protection and if the courageous step of discontinuing protection is now taken for the paper manufacture, that industry will also have a large healthy growth.

While on the subject of ability of industry to withstand the foreign competition it must be borne in mind that there is:—

- (a) Revenue import duty.
- (b) Ocean freight.
- (c) Railway freight on interior markets,

and these three factors act as a measure of protection large enough and counteract any additional cost to Indian mills either on account of less efficiency of our operators or the smallness of our individual units: I therefore advise that the protection to the Indian Paper Industry be withdrawn early.

(Sd.) JAGRAJ.

Lahore,

Dated 20th November, 1946.

APPENDIX I.
Import Tariff Schedule.
(Paper and Paper Products).
As on 31st March, 1942.

Item No.	Name of the Article.	Nature of Duty.	Standard rate of Duty.	Preferential rate of duty if the article is the produce of manufacture of:	
				A British Colony.	Burma.
1	2	3	4	5	6
1	Wood pulp	Protective.	25% <i>ad valorem</i> or Rs. 30 per ton which ever is higher.	..	10% <i>ad valorem</i>
2	<i>Writing Paper</i> :— (a) Ruled or printed forms (including paper with printed headings) and envelopes made of writing paper and account and manuscript books and binding thereof.	Protective.	Nine pies per lb. or 25% <i>ad valorem</i> which ever is higher.	..	
3	(b) All other sorts Printing paper (excluding poster and stereo), and all coated papers, but including art paper, all sorts which contain no mechanical wood pulp or in which the mechanical wood pulp amount to less than 70% of the fibre contents.	Protective. Protective.	Nine pies per lb. .. Nine pies per lb. ..	.. ..	10% <i>ad valorem</i>
4	Printing paper, all sorts not otherwise specified which contain mechanical wood pulp amounting to not less than 70% of the fibre content.	Revenue.	25% <i>ad valorem</i> ..	..	10% <i>ad valorem</i>

	Paper including poster and stereo and all coated papers except art paper, all sorts, not otherwise specified.	Revenue.	25% <i>ad valorem</i>	..	..	10% <i>ad valorem</i>
6	Pasteboard, mill board, cardboard and straw-board all sorts.	..	25% <i>ad valorem</i>	..	..	..
7	Trade catalogues and advertising circulars imported by packet book or parcel post.	..	Free	..	..	10% <i>ad valorem</i>
8	Paper money .. .. .	..	Free	..	..	..
9	Newspapers, old, in bales and bags	Revenue.	25% <i>ad valorem</i>	..	..	10% <i>ad valorem</i>
10	Article made of paper and papier-maché stationery including drawing and copy books, labels, advertising circulars, sheet or card almanacs and calendars, Christmas, Easter and other cards including cards in booklet forms including also wastepaper but excluding paper and stationery otherwise specified.	Revenue.	..	..	..	10% <i>ad valorem</i>
11	Books, printed, including covers for printed books, maps, charts, and plans, proofs, music, manuscripts, and illustrations specially made for binding in books.	Free.	Free	..	..	..
12	Prints, engravings, and pictures (including Photographs and picture postcards) on paper or cardboard.	Revenue.	50% <i>ad valorem</i>	..	..	20% <i>ad valorem</i>

APPENDIX II.
Analysis of Paper and Board Production.
Period 1st April, 1944 to 31st December, 1945.

Mill.	Printings and Writings.	Kraft and Imit-Kraft	Wrappings Browns etc.	Duplex and Triplex.	Boards pulp Boards.	Other varieties.	Special @ varieties.	Total Production
Titaghur ..	18,627.2	262.6	1,476.7	..	2,180.7	785.6	1,102.7	24,435.5
Bengal ..	7,840	..	892.75	..	4.75	..	130	8,876.5
I.P.P. ..	6,140.8	..	34.35	..	108.5	7.5	23.2	6,314.35
Shreegopal ..	6,112.55	..	330.5	..	..	..	59.95	6,503.00
U.I.G. ..	1,143.87	.61	57.34	..	..	1,233.48	45.27	2,480.57
Star ..	2,753.29	..	42.42	..	..	..	..	2,795.71
Deccan ..	1,464.06	7.67	444.25	..	..	17.73	125.68	2,059.39
Gujarat ..	439.90	..	19.65	..	..	..	386.73	846.28
Andhra ..	1,220.02	..	39.1	..	..	..	..	1,259.12
Pudumjee* ..	46.38	..	107.0	..	..	..	..	153.38
Sirpur ..	2,929.61	113.1	323.35	..	..	23.93	10.73	3,400.72
Mysore ..	1,594.34	..	..	..	..	..	..	1,594.34
Punalur ..	1,628.58	9.4	990.41	..	..	..	53.	2,681.39
Rohtas ..	..	..	..	4,303.94	..	3,029.62	..	7,333.56
Orient ..	46.1	6,798.53	..	804.45	..	735.58	..	8,384.66
Totals ..	..	7,191.91	4,757.82	5,108.39	2,293.95	5,833.44	..	..
Totals ..	51,986.7	..	11,949.73	..	13,235.78	..	1,937.26	79,109.47

*These include—Ferro Basw, Match Paper, Teleprinter, Toilet, Target, Blotting, Cigarette Tissue, Emery Base Paper, on the basis the breakdown of an estimate production of 105,000 tons as follows:—

Production 105,000 ..	68,975	9,550	6,325	6,775	3,050	7,750	2,575	1,05,000
Total ..	68,975	15,875	..	17,575	..	..	2,675	..

@Production is for November and December only as for the period April to October inclusive this mill was incorporated with Deccan.

APPENDIX II(a).

Paper Production.

In 1944 and average annual potential production capacity of different mills.

1. Paper:

Mill.	Tons.	Average annual production capacity (Tons.)
Titaghur	31,012.9	31,000
Bengal	11,960.6	11,000
I.P.P.	8,403.2	8,000
Shree Gopal	8,548.5	8,000
U.I.C.	1,970	3,000
Star	3,493.3	3,600
Deccan	2,850	3,000
Gujerat	1,254	1,200
Andhra	1,556.3	2,500
*Pudumjcc	153.4	..
Total	<u>71,301.2</u>	

*This mill was owned by Deccan Paper Mills but was sold on 23rd October, 1944 and is now operated as a separate concern. Production for the period January-October inclusive is included under Deccan.

State Mills:

Sirpur	4,471.4	5,000
Mysore	2,470.4	4,000
Punalur	3,524.9	3,500
Total	<u>10,466.7</u>	

Total (Paper) 81,767.9

2. Kraft.

Orient	8,859.4	10,000
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3. Boards.

Rohtas	9,772.3	
U.I.C.	1,359.4	
Orient	2,124.2	
Total	<u>13,255</u>	

4. Total Paper Kraft, Boards 13,883.2

APPENDIX II(b).

Actuals.

Paper Production, 1943.

Mills.	Tons.
Titaghur ..	32,177.8
Bengal ..	11,560.35
I.P.P. ..	8,451
Shree Gopal ..	7,540.86
U.I.C. ..	4,264.33
Star ..	3,901
Deccan ..	3,127.67
Gujarat ..	1,212.78
Andhra ..	1,275.38
Orient ..	9,544.47
Rohtas ..	8,818.54
State Mills.	
Sirpur ..	4,806.12
Mysore ..	3,049.24
Punalur ..	2,462.7
Total paper, kraft, boards ..	102,192.14

APPENDIX II(c).

Actuals.

Paper Production.

Period 1st January, 1944 to 30th June, 1944.

1. Paper

Mill.	Tons.
Titaghur	13,633.2
Bengal	5,990.4
I.P.P.	4,092
Shree Gopal	4,246.9
U.I.C.	1,180.5
Star	1,518.9
Deccan	1,471
Gujarat	704.7
Andhra	587
Total	33,424.6

State Mills.

Sirpur	2,198.3
Mysore	947.6
Punalur	1,666.7
Total	4,812.6
Total Paper	38,237.2

2. Kraft.

Orient	3,977.7
----------------	---------

3. Boards.

Rohtas	4,757.7
U.I.C.	433.9
Orient	1,087.6
Total	6,279.2

APPENDIX II (d):**Production of paper in India in pre-war years.***The Years are from April to March.*

Quality.	1936-37 Tons.	1937-38 Tons.	1938-39 Tons.	Average Tons.	1941-42 Tons.
Printing Paper ..	28,744	31,412	31,642	30,599	47,400
Writing Paper ..	14,620	16,386	20,291	17,099	16,223
Packing & Wrap- ping paper ..	2,956	3,521	3,647	3,375	18,238
Boards of all kinds	82	212	353	216	6,306
Other varieties of Paper ..	2,129	2,280	3,264	2,559	5,380
Totals ..	48,531	53,811	59,197	53,848	93,547

APPENDIX II (e).**Production of Paper in India during war years.***The years are April to March.*

Quality.	1939-40 Tons.	1940-41 Tons.	1941-42 Tons.	1942-43 Tons.
Printing	39,832	44,513	47,400	55,099
Writing	19,742	21,096	16,223	9,751
Packing and Wrapping Paper	5,213	12,772	18,238	16,984
Boards of all kinds and other varieties of paper ..	6,026	9,281	11,686	9,207
Total	70,813	87,662	93,547	91,041

Sources :—*Pre-war.*"Monthly Statistics of Certain Selected Industries". Published by
Director General of Commercial Intelligence and Statistics.*War Years.*Indian Paper Mills Association, believed to have been taken from
Director General of Commercial Intelligence and Statistics.

APPENDIX II(f).

Annual Production in Tons of Writing, Printing and Wrapping Papers and Boards.

1924-25	..	27,020	1925-26	..	28,221
1926-27	..	31,672	1927-28	..	34,678
1928-29	..	38,222	1929-30	..	38,609
1930-31	..	39,587	1931-32	..	40,558
1932-33	..	40,217	1933-34	..	43,658
1934-35	..	44,601	1935-36	..	48,099
1936-37	..	48,531	1937-38	..	53,811
1938-39	..	59,198	1939-40	..	70,813
1940-41	..	87,662	1941-42	..	93,547
1942-43	..	100,282*	1943-44	..	99,831*
			1944-45	..	70,020*

(For 8 months upto November, 1944).

*Approximate figures.

APPENDIX III.

Total Quantities of Chemicals required.

Name of Chemical.	1951 Tons.	1956 Tons.
1. Caustic Soda	10,600	18,400
2. Salt Cake	43,000	73,000
3. Sulphur	5,200	8,800
4. Magnesite	3,700	6,300
5. Lime	92,000	1,60,000
6. Soda Ash	16,000	30,000
7. Chlorine	7,000	11,000
8. Ferric Alum	12,600	22,600
9. Aluminium Sulphate	1,000	1,800
10. Rosin	5,800	10,800
11. Clay	30,000	47,300
12. Miscellaneous :-		
Dyes		
French chalk		
Barytes		
Starch		
Silicate	3,100	5,400
Glue		
Wax		
Sulphuric Acid		
Hydrochloric Acid		
Total	2,30,000	3,94,000

APPENDIX IV (a).

Approximate Annual Requirements of the Principal Raw Materials in Tons for Maximum Output.

Names of the Paper Mills.	Bamboo.	Sabai grass.	Rags.
1. Titaghur	68,000	14,000	800
2. Bengal	18,000	15,000	1,200
3. India Paper Pulp	18,000	..	500
4. Orient	36,000	..	2,000
5. Rohtas	30,000	..	6,000
6. Sirpur	18,000	..	..
7. Upper India Couper .. ..	..	7,000	3,000
8. Star .. ..	..	13,000	..
9. Shree Gopal .. ..	..	17,000	4,000
10. Deccan .. ..	..	..	2,400
11. Andhra	6,000	..	..
12. Punalur	8,000	..	400
13. Mysore	8,000	..	1,200
14. Gujrat .. ..	..	..	..
Total	2,10,000	66,000	21,500

APPENDIX IV(b).

Average Monthly Requirements of Different Chemicals in Tons.

Name of the Paper Mills.	Alum Ferric.	Caustic Soda.	Soda Ash.	Salt Cake and Salt.	Sodium Sulphide	Bleaching Powder.	Sulphur.	Magnesi- site.	Rosin.	China Clay.	Barium Chloride
1. Titaghur	210*	25*	103	160	60	25*	..	..	46	290	..
2. Beñgal	90	70	..	90	..	125	..	..	17	125	..
3. Indian Paper Pulp	40*	..	..	..	..	130	120	92	18	75	..
4. Shree Gopal	70	60	3	90	..	35	..	..	12	70	..
5. Star ..	36	10*	60	..	..	75	..	..	8	40	..
6. Upper India Paper	35	3	20	..	..	10*	..	..	8	40	..
7. Sirpur..	40	25*	40	60	..	..	..	..	11	45	1
8. Mysore	25	45*	50	40	10	..	..	..	6	35	..
9. Deccan	10	1*	1	..	..	1*	..	..	6	30	..
10. Punalur	10	30	40	..	6	..	..	..	3	30	..
11. Gujrat	12	13	..	..	..	10	..	..	3	20	..
12. Andhra	12	58	..	10	5	25	..	..	6	25	..
13. Orient	110	25	200	..	10	..	..	..	20	..	..
14. Rohtas	40	120	100	150	..	..	..	..	15	..	3
Total ..	740	485	617	600	91	436	120	92	179	815	4

*In addition to the quantities manufactured by these Mills.

APPENDIX IV(c).

**Analysis of Coal Requirements of the Paper Industry.
(In Tons.)**

Based on the period 1st January, 1944 to 31st December, 1944.

1. Principal Paper and Board Mills.

Mill.	Total coal Allocation.	Total Coal Consumption.	Total Paper and Board Production	Coal required per ton. of paper.	Potential production per month.	Coal* required for potential production.
Titaghur ..	1,28,200	1,13,446	30,908.3	3.67	3,000	11,020
Bengal ..	37,540	48,194	11,960.6	4.02	1,100	4,420
I.P.P. ..	30,200	30,486	8,493.2	3.58	750	2,680
Shree Gopal ..	30,920	32,099.1	8,548.5	3.75	300	3,000
Star ..	18,560	15,466	3,493.3	4.42	500	2,220
U.I.C. ..	15,600	13,530	3,348.4	4.04	425	1,720
Mysore ..	9,900	4,965	2,424.4	2.04	325	660
Deccan ..	5,100	4,865.6	2,850.0	1.70	275	480
Gujarat ..	2,486	2,345	1,254.0	1.87	150	280
Andhra ..	6,800	7,752.9	1,556.3	4.98	225	1,120
Orient ..	36,500	40,192.9	10,942.5	3.67	1,100	4,040
Rohtas ..	3,33,890	39,467.7	9,772.3	4.03	1,000	4,040
Totals ..	3,55,690	3,52,810.2	95,551.8	(**)	9,650	35,680

(**) Equals 115,800 tons per annum.

(44)

2. *Straw-board and Mill Board Mills.* (@)

Jaswant ..	3,550	2,278.2	1,415.1	0.69	500	360
Straw Products ..	7,670	6,540.9	1,569.7	1.78	500	900
Straw Mfg. ..	2,300	1,546.2	579.5	1.18	435	520
Standard ..	1,420	1,726.1	971.5	1.18	420	500
Totals ..	14,940	12,091.4	4,535.8	...	1,855	2,280
Grand Totals ..	370,630	364,901.6	..	..	..	37,960

(@) Production for the period August-December, 1944 only.

(*) To the nearest complete wagon i.e. 20 tons.

3. The following Mills are excluded from the above figures in (1) and (2) above.

- (a) *Sirpur*:—This mill receives a separate allocation from the Coal Controller, Secunderabad, on the Singareni Mines amounting to approximately 3,000 tons per month. Considering the average production of this mill is 400 tons per month and after allowing for the poor quality of the Singareni coal, this allocation is considered to be high. The matter is being investigated.
- (b) *Punalur*:—This mill uses fuel wood only.
- (c) *Pudumji Mills*:—This mill has recently converted its boilers to oil firing.
- (d) *Paper Processing*:—In addition to keeping the mills supplied, coal from the industry's allocation has been allocated to contractors processing paper, *i.e.* wazing, water-proofing, carton making, which contracts are issued by this Directorate. Such miscellaneous all contains amounted to 1,370 in 1944.

4. Total allocated to the industry during 1944	..	3,72,000 tons.
Total received by the industry during 1944	..	3,50,150.5 tons.
Stock held by the mills on 1st January, 1944	..	31,439.6 tons.
Stock held by the mills on 31st December, 1944	..	13,607.3 tons.

5. Total estimated monthly allocation which is required to meet the full needs of those mills who are at present receiving all allocation, to bring in those smaller mills who have been receiving no allocation upto now and to cover the requirements of contractors processing paper etc.	39,300 tons.
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This is the quantity actually required to be received by the quota holders which means that on the basis of the experience of the relationship between allocations and receipt during 1944, the quota required on paper to meet the above requirements would be : 41,600 tons.

APPENDIX IV (d).

Production of Caustic and Chlorine by Paper Mills.

Serial No.	Names of Paper Mills.	Cell in use.	Caustic Soda.		Chlorine.		Remarks
			Production during 1943.	Production during first 6 months of 1944.	Production during 1943.	Production during first 6 months of 1944.	
1	2	3	4	5	6	7	8
1	Titaghur Paper Mills	Nelson cells..	Tons. 2,422	Tons. 1,162	Tons. 2,123	Tons. 1,003	3-550 KVA Transformers connected to 3-550 KW Rotary converters—750 R.P.M. Input 136/164 volts A.C. Output 170-24 volts D.C. Cells:— 300 Cells at 100 cells per machine connected in parallel banks of 50 cells in series.
2	Shree Gopal Paper Mills.	KML type Allen Moore.	475	253	387	207	One set for 40 cells 250 K.W. 980 R.P.M. 100/120 Volts 1200/1500 AMPS.
3	Deccan Paper Mills.	Mather Plates.	..	..	2.30	1.50	No, but have Belt driver D.C. Dynamo capable of producing 220 Volts and 100 AMPS driven by a separate A.C. Motor.

APPENDIX IV(d) --(Contd.)

1	2	3	4	5	6	7	8
4	Mysore Paper Mills.	Siemens Pestatozza.	..	..	63	5.50	<p>One set Induction Motor—3 Phase 440 vy. 338 amps. 105 K.W. 735 R.P.M. F.P.C. 9.25 Cycles. Rot 435 vy. 280 amps. D.C. generator 94/110 volts 1500 lamps, 141/165 K.W. 735 R.P.M. Self Excitation 94/110 Volts. Wasting House Generator Set 210 K.W. Two Motor generator sets ran parallel for the 20 mercury Cells:— (1) 90 Volts. 4000 amps. (now running at 1000 amps.) (2) 220 Volts 1300 amps. (Now running at 900 amps.) one Motor generator set for the diaphragm Cell: 100 Volts—2600 amps. (Now running at 1200 amps.) condition of these generators are not satisfactory and therefore not getting full lead according to specification.</p>
5	Sirpur Paper Mills.	Allen Moore	292	140	254	120	
6	Rohtas Industries Ltd.	20 Mercury Cells moving Cathode-Krebs system II Diaphragm Cells—horizontal diaphragm.	648.35	263.43	539.99	239.68	
		Total ..	3,837.35	1818.43	3423.20	1576.68	

APPENDIX V.

Imports of Paper making raw material and paper mill machinery in India.

(1935-36 to 1943-44).

Years.	Wood Pulp.		Bags and other materials.		Machinery.
	'Q'	'V'	'Q'	'V'	'V'
1935-36 ..	15,471	20.4	1	734	(Rs.) 8.0
1936-37 ..	11,047	14.5	14	8,272	7.8
1937-38 ..	10,716	17.1	325		44.8
1938-39 ..	13,845	25.8	493		27.6
1939-40 ..	11,715	21.8	804		13.3
1940-41 ..	4,443	12.2	524		31.0
1941-42 ..	2,916	10.6	666		31.0
1942-43 ..	623	2.5	197		15.0
1943-44 ..	892	3.7	242		25.1

'Q'—Quantity in tons.

'V'—Value in lakhs Rs.

APPENDIX V(a).

Imports of Printing and Writing Papers in India.

(1935-36 to 1943-44).

Years.	Printing Paper.		Writing Paper.		Litho and Poster Papers etc	
	'Q'	'V'	'Q'	'V'	'Q'	'V'
1935-36 ..	14,597	38.8	7,361	34.7	1,809	4.7
1936-37 ..	10,790	30.0	7,524	33.5	1,523	3.7
1937-38 ..	15,339	51.8	8,949	46.6	2,484	8.7
1938-39 ..	12,004	36.5	9,076	44.5	1,513	4.3
1939-40 ..	8,752	30.6	6,754	34.4	1,218	3.7
1940-41 ..	5,051	29.3	3,231	28.6	261	1.5
1941-42 ..	3,054	29.3	1,460	18.6	123	0.7
1942-43 ..	558	8.2	984	14.5	53	0.7
1943-44 ..	926	12.6	924	14.6	68	0.6

'Q'—Quantity in tons.

'V'—Value in lakhs rupees.

APPENDIX V(b).**Import of Newsprint in India.**

(1935-36 to 1943-44).

Years.	Quantity (tons).	Value (lakhs Rs.)
1935-36	34,327	52.4
1936-37	36,748	52.9
1937-38	43,245	78.7
1938-39	32,540	51.8
1939-40	36,714	71.3
1940-41	30,730	89.1
1941-42	28,277	109.3
1942-43	11,237	57.6
1943-44	13,777	45.7

APPENDIX V(c).**Imports of baled Newspapers in India.**

(1935-36 to 1943-44).

Years.	Quantity in Tons.	Value (in lakhs Rs.)
1935-36	57,583	41.6
1936-37	64,730	38.8
1937-38	48,809	47.4
1938-39	47,383	38.5
1939-40	33,357	38.3
1940-41	35,214	56.8
1941-42	12,507	29.8
1942-43	1,191	2.99
1943-44	5	.01

APPENDIX V(d).

Import of blotting papers, paper manufactures etc. in India.

Years.	Blotting paper.		Other sorts of Paper.		Paper Manufactures.	
	'Q'	'V'	'Q'	'V'	'Q'	'V'
1935-36	302	1.6	3,543	19.7	2,018	15.5
1936-37	277	1.5	3,528	19.3	2,049	17.7
1937-38	285	1.7	2,938	20.6	2,399	20.3
1938-39	250	1.3	2,875	18.0	1,537	16.1
1939-40	212	1.6	1,921	13.7	1,600	13.2
1940-41	116	1.0	1,156	17.5	1,156	19.4
1941-42	104	1.1	1,163	28.2	1,760	22.5
1942-43	32	0.4	1,509	42.1	731	13.7
1943-44	15	0.2	1,340	36.4	113	3.1

'Q'—Quantity in tons.

'V' Value in Lakhs Rs.

APPENDIX

Imports of wrapping

(1935-36 to

Product.	1935-36.		1936-37.		1937-38.	
	Q	V	Q	V	Q	V
1. Kraft (Including imitation kraft) ..	9,543	21.4	8,626	19.9	13,804	39.0
2. Brown wrappings (other sorts) ..	678	1.2	323	0.5	381	0.9
3. Coloured machine-glazed pressings ..	532	1.0	476	0.8	160	0.3
4. Manilla, machine glazed or unglazed ..	1,051	4.1	1,881	4.1	2,527	7.2
5. Fancy including embossed ..	124	0.9	48	0.5	248	2.4
6. Oil waxed and other waterproof wrappings ..	..	..	..	..	..	..
7. Other sorts ..	7,543	24.2	6,851	21.2	8,396	34.0
Total ..	20,274	53.0	18,207	43.0	25,520	83.8

Q-Quantity in tons.

V-Value in Rs. (lakhs).

V(e).

papers in India.

1943-44).

1938-39.		1939-40.		1940-41.		1941-42.		1942-43.		1943-44.	
Q	V	Q	V	Q	V	Q	V	Q	V	Q	V
8,430	24.2	10,150	40.0	3,419	20.0	2,337	13.4	440	3.4	1,004	7.0
527	1.1	270	0.6	161	0.8	78	0.4	16	0.1	..	..
241	0.5	170	0.3	22	0.1	10	0.05	..	..	..	..
2,173	5.8	1,437	4.8	383	2.1	265	1.8	..	..	..	..
128	1.3	50	0.6	24	0.8	11	0.2	4	.06	..	..
1,319	5.5	1,463	6.6	1,428	11.2	700	6.4	258	2.7	368	..
6,568	28.0	5,360	20.0	4,100	41.2	3,442	46.1	1,428	46.1	2,408	88.0
19,803	66.4	13,901	82.5	9,046	76.2	6,845	68.2	2,148	25.2	3,780	49.1

APPENDIX VI.

List of Paper Mills in India.

1. Titaghur Paper Mills, Chartered Bank buildings, Calcutta.
2. Factories—Titaghur and Kankinara 24, Parganas, Bengal.
3. Bengal Paper Mills Co. Ltd., 103, Clive Street, Calcutta. Factory—Raniganj Burdwan.
4. India Paper Pulp Co., Ltd., 8, Clive Street, Calcutta. Factory—Halisatar Naihati.
5. Shree Gopal Paper Mills Ltd., Jagadhri N.W.R. (2)
6. Star Paper Mills Ltd., 117, Russa Road, Calcutta. Factory—(3) Saharanpur.
7. Upper India Couper Paper Mills Co., Ltd., Lucknow.
8. Mysore Paper Mills Ltd., Bhadravati, Mysore State.
9. Deccan Paper Mills Co., Ltd., 815-16, Bhowani Peth, Poona. (3) (3)
10. Gujrat Paper Mills Ltd., 653, Sakar Bazaar, Ahmedabad. (2) (2)
11. Andhra Paper Mills, Co., Ltd., Rajamundry (Madras). (3) (3)
12. Sirpur Paper Mills Ltd., Sirpur, Kaghaznagar. (2) (2)
13. Punalur Paper Mills Ltd., Punalur, Travancore State. (2) (3)
14. Orient Paper Mills Ltd., 8, Royal Exchange Place, Calcutta. Factory—District Sambhalpur, Orissa.
15. Pudumjee Paper Mills, Lamington Road, Bombay. (2) (4)
16. Rohtas Industries Ltd., Dalmianagar, Bihar.

APPENDIX VII.

Imports of Straw boards, other boards, Board Manufactures in India.

(1930-31 to 1943-44).

Years.	Straw-boards.		Other boards.		Board manufactures.	
	'Q'	'V'	'Q'	'V'	'Q'	'V'
1930-31 ..	11,910	14.5	3,260	10.4	253	1.8
1931-32 ..	9,872	11.6	3,531	11.0	372	3.3
1932-33 ..	14,989	18.4	5,630	16.2	356	2.5
1933-34 ..	9,714	9.5	5,645	14.2	492	3.9
1934-35 ..	13,210	12.2	6,731	15.9	906	5.2
1935-36 ..	15,089	12.8	9,085	20.8	671	2.8
1936-37 ..	13,450	11.3	10,156	21.1	638	2.9
1937-38 ..	17,044	16.7	13,462	33.3	1,177	5.0
1938-39 ..	16,876	17.0	8,566	22.1	1,614	5.3
1939-40 ..	15,353	25.6	8,909	34.9	1,358	5.8
1940-41 ..	7,006	15.1	9,268	42.7	916	7.4
1941-42 ..	2,278	7.3	7,567	40.4	247	2.6
1942-43 ..	53	0.3	2,358	11.7	217	2.1
1943-44 ..	..	..	1,519	13.6	123	1.9

Q-Quantity in tons.

V-Value in lakhs rupees.

APPENDIX VIII.

Annual Potential capacities of different Board Factories.

	Name of Mill.	(In tons.)
1.	Rohtas Industries Ltd., Dalmianagar	10,000
2.	Straw-Board Manufacturing Co. Ltd., Saharanpur ..	6,000
3.	Straw Products Ltd., Bhopal	6,000
4.	Jaswant Straw-board Mills Ltd., Meerut	6,000
5.	Upper India Couper Paper Mills Ltd., Lucknow ..	2,000
6.	Orient Paper Mills Ltd.	4,000
7.	Standard Board and Paper Mills Ltd., Calcutta ..	3,000
8.	Rewa Board Mills, Rewa	3,000
9.	Pioneer Paper and Pulp Mills Ltd., Calcutta ..	1,000
10.	India Paper and Board Mills Ltd., Dum Dum, Calcutta ..	1,000
11.	Other small Board Mills in Bengal	1,000
12.	Western India Paper and Board Mills Ltd., Bombay ..	1,000
13.	Arwin Paper and Board Mills, Billimora (Gujerat) ..	3,000
14.	Gujerat Paper Mills Ltd., Ahmedabad	900
	Total	47,900

Note :—The above list includes names of only those which are in actual production. The present production of many of these Mills is much below their potential capacities. There are several other Mills under construction or ready for starting work. Besides, names of very small plants have not been mentioned.