



**TOGETHER**  
*for a sustainable future*

## OCCASION

This publication has been made available to the public on the occasion of the 50<sup>th</sup> anniversary of the United Nations Industrial Development Organisation.



**TOGETHER**  
*for a sustainable future*

## DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

## FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

## CONTACT

Please contact [publications@unido.org](mailto:publications@unido.org) for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at [www.unido.org](http://www.unido.org)

08834

Distr.  
LIMITED  
ID/WG. 282/51  
4 October 1978  
ENGLISH



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

---

# INTERNATIONAL FORUM ON APPROPRIATE INDUSTRIAL TECHNOLOGY

New Delhi/Anand, India 20-30 November 1978

.....

**WORKING GROUP No.10**

**APPROPRIATE TECHNOLOGY  
FOR THE MANUFACTURE OF  
PULP AND PAPER PRODUCTS**

.....

**EVOLUTION OF THE PULP AND PAPER INDUSTRY IN THE PHILIPPINES**  
Background Paper

EVOLUTION OF THE PULP AND PAPER INDUSTRY  
IN THE PHILIPPINES

by

P. M. Picornell  
UNIDO consultant

The description and classification of countries and territories in this document and the arrangement of the material do not imply the expression of any opinion whatsoever on the part of the secretariat of UNIDO concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries, or regarding its economic system or degree of development.

The views and opinions expressed in this document are those of the author(s) and do not necessarily reflect the views of the secretariat of UNIDO.

Mention of firm names and commercial products does not imply the endorsement of the secretariat of UNIDO.

The document is reproduced in the form in which it was received and it has not been formally edited.

Paper has been used in the Philippines for hundreds of years, but the pulp and paper industry is relatively new. While the first known mill in the country was built in 1939, the real development of this industry only came about in the middle 1950's. The pulp and paper industry is a very capital intensive industry, and this means that the economics of scale become very important, particularly in the manufacture of the cheaper papers such as newsprint and containerboard. The establishment of a modern pulp and paper industry in a developing country such as the Philippines depends on:

1. The availability of a market. The country has to have a domestic market large enough to take most of the production of the mill. Except for highly specialized items, building a pulp and paper mill in a developing country based on exporting a substantial portion of its production is very dangerous. New mills in developing countries usually have higher costs than established mills in developed countries, particularly where there are organizations operating a number of mills of large capacities, and it is very easy for these to underbid a single new mill in a developing country in the export market.
2. The availability of raw materials in sufficient quantities is also very important. Building a pulp and paper mill in a developing country based on imported raw materials is very dangerous

particularly if the source of raw materials is a developed country. Such a mill should be able to control a substantial part of its raw materials requirements and be able to bring these to the millsite at a reasonable cost, preferably at a lower cost than these are available in developed countries. Most of the time, the ability to use cheaper raw materials is the only advantage that such a mill can claim over a similar mill in a developed country.

3. Adequate financing is absolutely essential. A pulp and paper mill is very capital intensive and its start-up costs can be very high and to have to borrow money during construction and start-up because of inadequate financing, can place financial burdens on such projects which may end up wrecking these.
4. Realistic feasibility studies and proper design, construction, and start-up are most important. Many a pulp and paper mill in developing countries has failed because of poorly made feasibility studies, improper design, short cuts in construction, and poor start-ups, particularly when training the local operating crews to take over the operations.
5. Proper attitude of government is also most important, particularly in developing countries where the role of government in industry is significant. It must always be remembered that a pulp and paper mill is a long term program with a comparatively small return on investment. Once such a mill is built, there is a long term commitment to get an adequate return on the investment made. Changes in government policies which will sub-

tantially alter the basic economic premises under which the mill was established can rapidly ruin it.

These points are not listed in the order of importance. All are equally important and a deficiency in any one of them can result in very serious consequences for the mill in question.

The story of the development of the pulp and paper industry in the Philippines is typical of what may be experienced in other developing countries. It has examples of the effects of all the points given above, and it is a story of successes and failures, of projects gone sour and dreams come true. Because of lack of space, only the highlights can be mentioned but we hope that these will enable the reader to get a good idea of its course. As of August, 1978, the pulp and paper industry in the Philippines essentially consisted of 19 mills; only 5 of these being fully integrated pulp and paper mills. Their capacities and products they produce can be found in the table that follows. These have made the country self-sufficient in the types of paper presently produced there.

Writing was known to have existed in the Philippines before the coming of the Spaniards in the 16th Century. The Filipinos had the use of an alphabet and some written records must have been kept but none of these have survived. The early chronicles tell us that the Filipinos wrote on palm or banana leaves, beaten bark of trees, and bamboo strips. These are not durable materials considering the moist tropical climate and environment of the country and may explain why none of these writings are available today. The Chinese had also been visiting the country for centuries before the Spaniards, and they already had paper, so that it is possible that the first paper as we know it could have been brought over by them.

However, no record of this has been found.

The earliest paper that came to the Philippines on a regular basis came with the Spaniards and many samples of it may be found in the various Spanish archives because of the voluminous correspondence maintained between the colony and the authorities in Spain. In fact, paper was one of the items included in the first requisition for supplies made by the Legaspi expedition on establishing the first permanent Spanish settlement in Cebu in 1565.

No record has been found on paper being manufactured in the Philippines during the Spanish occupation which lasted from 1565 to 1898. All the paper used in the country was imported, some from Spain and very much from China, although we cannot discount the possibility that from time to time, there could have been small scale "cottage type" papermaking in the Philippines as the country did have some materials suitable for this purpose at that time, cotton and rice straw, and know-how was available from China. Very many documents which were written at that time on Chinese type paper can be found in the various archives in Spain.

During the first three decades of the American regime (1898 to 1946) paper continued to be imported with North America becoming the leading supplier of this commodity. The Philippines did not have the market to justify the mass production of paper, and the vast forest resources in the country were not believed to be suitable for this purpose. The rapid development of the sugar industry in the 1920's and the development of processes for mass producing paper from straw and bamboo at about that time, saw a surge of interest in the 1930's. In 1935, a group of local industrialists which included Col. Andres Soriano of whom we will say more



later, formed the Alpha Cellulose Syndicate which brought in Dr. William Raitt, a noted expert in the manufacture of paper from bamboo, to the Philippines to look into the possibility of establishing a pulp and paper industry based on this material. His activities were brought to a halt by the start of World War II.

In the meantime, the Compañia General de Tabacos de Filipinas, organized the Compañia de Celulosa de Filipinas which built a 10-ton per day pulp and paper mill at Bais, Negros Oriental based on bagasse from a sugar mill they controlled in this area (Central Azucarera de Bais) in 1939. This mill, which had an initial capacity of 10 metric tons of bleached paper per day, was based on the Pomilio process, consisting of a mild caustic cook, chlorination with gaseous chlorine, followed by a conventional bleaching system. It was to serve as a pilot operation for a larger mill to be built at another sugar mill they controlled (Central Azucarera de Tarlac). It was in the process of starting up with it was shut down because of the start of World War II. Fortunately, it suffered very little damages during the war, and it was rehabilitated and placed back in operation in the late 1940's. This mill, which is still in operation, is the first pulp and paper mill built in the Philippines and it now has a capacity of 45 metric tons of bleached writing paper a day. The pulp and paper mill at Tarlac was never built.

In 1950, the National Development Corporation, a government owned corporation, brought in a 20 ton per day paper machine to produce cement bags from imported pulp. This machine was later transferred to the APO Cement Corporation for the same purpose and it operated intermittently for a few years until it was finally shut down.

In 1948, San Miguel Brewery, Inc. (now San Miguel Corporation) started up the first paper corrugator in the country, using imported containerboard. The popularity of this packaging product increased by leaps and bounds, and created a growing demand for containerboard. More on this later on.

Because of a deteriorating balance of payment position, the government was forced to institute import controls in the late 1940's and these went on through the 1950's. These encouraged the establishment of a number of small paper mills, operating on imported pulp and/or waste paper. The first of these was the Philippine Paper Mills, Inc. established by Dr. Alexander Adamson, which started up in 1951 to produce chipboard from waste paper. Most of these mills have been successful, having gotten a headstart during a time when pulp and waste paper were readily available throughout the world. They are all relatively small, but it is doubtful that such mills could be built and operated profitably at present, when the supply of market pulp is tightening up. Since those days, the Philippine government has established a policy that no new mill that is not integrated with a pulp mill will be allowed unless it can get a long-term agreement with a domestic pulp producer for its supply of raw materials.

In 1960, a group of local businessmen organized the Bataan Pulp and Paper Mills, Inc. to build a pulp and paper mill based on bamboo as envisioned by Dr. William Raitt mentioned earlier. This mill, with a capacity of 75 metric tons of bleached writing paper a day, started up in 1962, but unfortunately, it almost immediately ran into a very serious problem in the supply of raw materials; the availability of bamboo turned out to be limited, and the mill had to compete for it with other users of

this very versatile material. After a number of years of difficulties, this mill was successfully converted to use hardwood sawmill waste, and today, it is operating profitably at capacity.

During these years, the need to establish a paper mill to produce the cheap but high demand papers such as newsprint and containerboard was evident, but there were two problems that had to be solved in order to do this, as follows:

1. Newsprint and containerboard are low cost products and a large market has to be available to justify a mill of the size to take advantage of the economics of scale to produce these at a cheap price.
2. The only raw material available in the Philippine in sufficient quantities to feed such a mill was wood. However, most of the woods available in the Philippines are hardwoods which are short fibered, and up to the late 1950's, these were not believed to be suitable for the manufacture of newsprint or containerboard. There are limited volumes of pine (a long fibered specie) available in the highlands of northern Luzon, but detailed surveys indicated that it could not be extracted in sufficient quantities or at a cost low enough for the economic manufacture of such low-priced products.

In other words, to be able to produce newsprint and containerboard, both large volume, low price products we needed the market and the technology to process local raw materials. The demand for these products was growing steadily and the availability of a sufficient market to justify a mill which would give us the economics of scale was but a matter of time. The

use of domestic raw materials for this purpose would be the main problem to be solved.

In 1950, Col. Andres Soriano, who has been mentioned earlier as one of the organizers of the Alpha Cellulose Syndicate, organized Bislig Bay Lumber Company, Inc. to operate a timber concession on the eastern coast of the island of Mindanao which was to form the raw materials base for a large scale pulp and paper mill in the Philippines. He was confident that technology could be developed to use the short fibered Philippine Mahogany in the manufacture of paper, and he was particularly interested in producing kraft containerboard for use in the corrugated carton plant of San Miguel Brewery, Inc. of which he was President. A research program was immediately started on the use of Philippine woods for this purpose, and in 1953, he organized Bislig Industries, Inc. to implement this project. Bislig Industries, Inc. is the company we now know as Paper Industries Corporation of the Philippines.

Col. Soriano interested International Paper Company, the largest paper company in the world, in joining this project, and by the late 1950's, after exhaustive tests which included full scale mill tests carried out in International's mills in the United States, it was concluded that with improved technology, both newsprint and containerboard could be made out of Philippine hardwoods. It took another ten years until the market grew to a point that would justify an economically sized mill and to iron out technical, legal, and financial details and construction of the mill proper started in 1969. This mill, with an initial capacity of 71,400 metric tons of newsprint and 63,600 metric tons of kraft containerboard a year was started up late in 1972. The start up was not easy as problems which were

not evident in laboratory and pilot plant work came up in full-scale commercial operations, but these were solved one by one. Just as the mill overcame its most serious problem, it was severely hit by the world depression in 1974 and 1975. However, as technology was perfected in actual operations, its capacity was expanded twice without major additions of machinery and equipment, and by the end of 1978, it will have a capacity of 100,800 metric tons of newsprint and 73,000 metric tons of kraft containerboard per year. The gradual recovery of the world paper demand will improve the financial strength of this mill which was severely strained during the last depression. This mill has proved beyond any doubt that good quality newsprint and kraft containerboard can be made out of tropical hardwoods, thus adding these type of woods to the list of raw materials for the paper industry throughout the world.

In the meantime, Rustan Pulp and Paper Mills, Inc. built an integrated pulp and paper mill with a capacity of 105 metric tons of linerboard at Iligan, on the northern coast of the island of Mindanao. This mill, fed with wood waste from various timber operations in its vicinity, was started up in 1972. It was also badly affected by the world depression, and in November, 1977, it was merged with Paper Industries Corporation of the Philippines.

In the late 1960's, there was renewed interest in paper made out of abaca (Manila hemp) as prices for high grade papers increased and this material became available as rope manufacturers, who previously took up most of the supply of this fiber, turned to synthetic fibers. Rustan Pulp and Paper Mills, Inc. built an abaca pulp mill at its installations at Iligan, and Menzi Development Corporation built a pulp and paper mill at

Talakag, also on the northern coast of Mindanao, and two abaca pulp mills, Canlubang Sugar Estate and Isarog Pulp and Paper Company were built on the southern part of the island of Luzon. All of these mills are of small capacity (under 20 metric tons per day) and manufacture a very highly specialized product.

At the same time, United Pulp and Paper Company built an integrated pulp and paper mill in Bulacan also on the island of Luzon, to produce 30,930 metric tons per year of sack kraft for cement bags. This mill uses bagasse pulp manufactured in its own pulp mill and imported long fiber pulp, and was started up in 1973.

In 1978, Cellophil Resources Corporation, broke ground for a 200 metric ton per day pulp mill in the province of Abra, in northern Luzon to produce long fiber pulp out of the pine stands on the highlands in that region. This mill will start up in 1979, and is expected to supply a part of the long-fiber requirements of the country.

The pulp and paper industry of the Philippines has been badly hit by the present recession. Developed countries have repeatedly dumped paper into the country at incredibly low prices which severely are into the markets of the local industry. Quantities of paper which may be insignificant when compared to the capacity of a developed country, can represent a substantial part of the demand of a developing country, and thus wreck the market for local industry for a considerable length of time. At the time of preparing this study (August 1978), the pulp and paper industry of the Philippines is starting to recover from the worst crisis of its short existence. While a number of new mills are on the drawing board, there are actually no new mills under construction other

than that of Cellophil Resources Corporation mentioned earlier. High costs and relatively low prices will continue to retard new construction for some time to come. However, after surviving the present crisis, we expect the pulp and paper industry of the Philippines to emerge from it in a more efficient and stronger financial condition. Steps are being taken to increase the reserve of raw materials through an extensive reforestation program, and the Philippines is expected to become a significant factor in this industry in Asia.

TABLE I

PULP AND PAPER MILLS IN THE PHILIPPINES

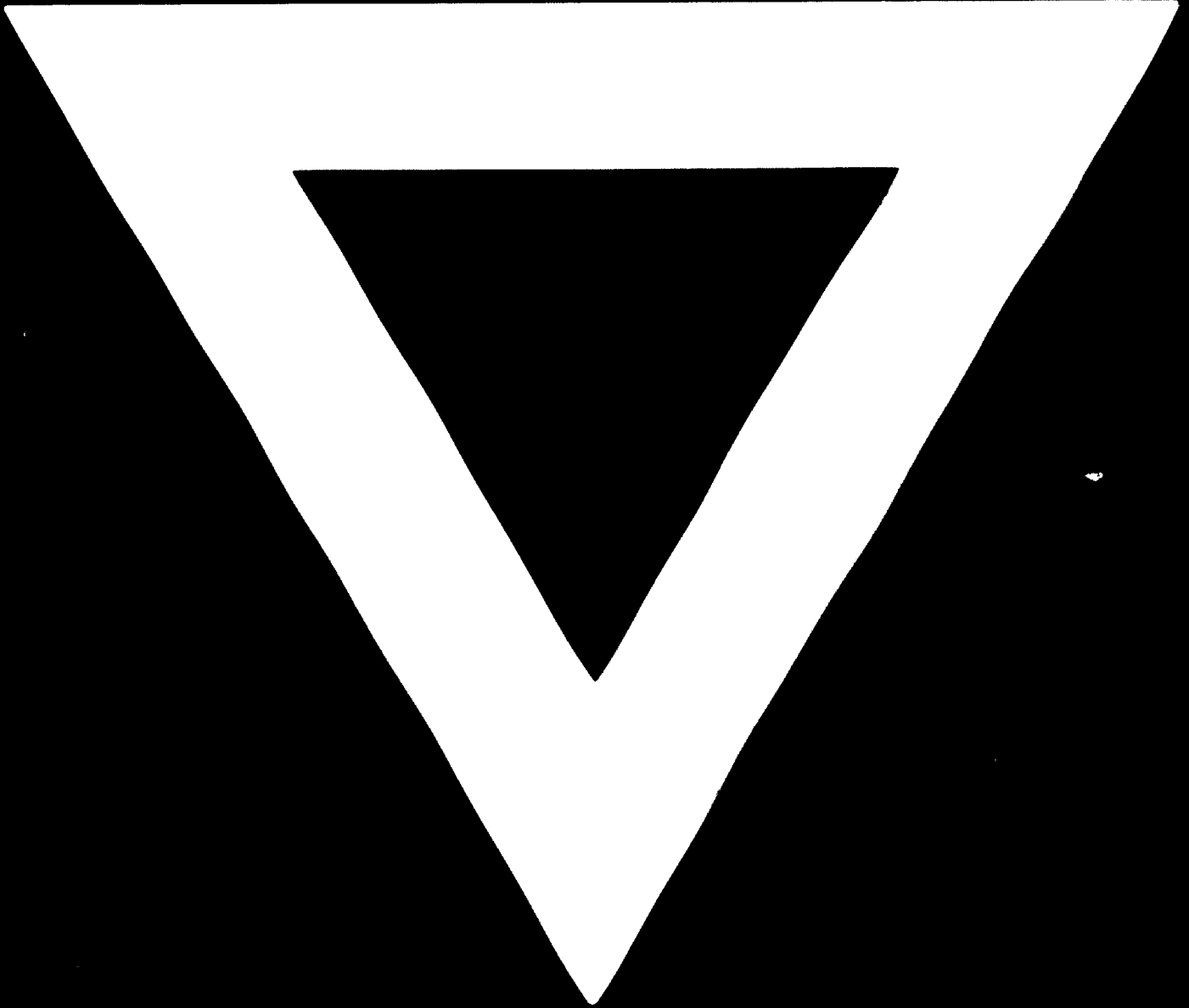
1 9 7 7

<u>N a m e</u>	<u>Product Lines</u>	<u>Capacity M.T./year</u>	<u>Remarks</u>
1. Aclem Paper Mills	Printing/writing, wrapping	6,600	paper mill only
2. Arco Pulp & Paper Co.	Sanitary, wrapping, corrugating medium	4,490	paper mill only
3. Bataan Pulp & Paper Mills, Inc.	Printing/writing	25,200	pulp & paper mill
4. Central Azucarera de Bais	Printing & writing, chip- board	13,175	pulp & paper mill
5. Container Corp. of the Philippines	Boxboard, chipboard	18,000	paper mill only
6. Eastern Paper Mills, Inc.	Corrugating Medium, sack kraft	17,960	paper mill only
7. Globe Paper Mills, Inc.	Writing/printing, wrapping	8,980	paper mill only
8. Kimberly Clark (Phils.) Inc.	Sanitary	8,027	paper mill only
9. Manila Paper Mills, Inc.	Writing/printing, sanitary, linerboard, corrugating medium, wrappint, sack- kraft, boxboard	50,240	paper mill only
10. Menzi Development Corp.	Writing/printing	4,620	pulp & paper mill
11. Paper Industries Corp. of the Philippines - Bislig Mill	Newsprint, linerboard corrugating medium	136,530	pulp & paper mill
12. Paper Industries Corp. of the Philippines - Iligan Mill	Linerboard, abaca pulp	30,000	pulp & paper mill
13. Phil. Paper Mills, Inc.	Boxboard, chipboard	11,970	paper mill only
14. Premier Paper Corp.	Printing/writing	2,200	paper mill only
15. Scott Paper (Phils.) Inc.	Printing/ writing, sanirary	16,500	paper mill only
16. United Pulp & Paper Co., Inc.	Sackkraft	30,000	pulp & paper mill
17. Worldwide Paper Mills, Inc.	Others	8,980	paper mill only
18. Canlubang Sugar Estate, Inc.	Abaca pulp		pulp mill only
19. Isarog Pulp & Paper Co.	Abaca pulp		pulp mill only





**B-37**



**79.12.04**