

Education and training in pulp and paper technology In eastern & southern Africa

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ABSTRACT

The current production, consumption and training situations in pulp and paper in the Eastern and Southern African region have been considered providing possible remedial measures that can be undertaken to improve and alleviate the situation. Mention has been made of the significance of pulp and paper industries in the economics and development of the countries, emphasising the role of training and education in the production and utilisation of their and other related products. The main factors responsible for the big gap between demand and supply in pulp and paper in this region have been discussed.

Introduction

Paper and paper-board consumption in Africa in 1987 is estimated to about 2.0 million t., which represents a mere one per cent of the total world consumption against a population accounting for about ten per cent. (1)

The average 1987 per capita consumption of paper in the world was 42 kg in contrast to 4 kg in Africa. Some countries with less than 1 kg The consumption is heavily concentrated in North African subregions. Table I.

Pulp and paper production in Eastern and Southern Africa is extremely low. Kenya and Swaziland are the only countries in this region with production capacities exceeding 100,000 t/a (2, 3, 4, 5)

However there is a high potential to boost this production due to the abundant availability of raw materials-especially wood from tropical forests. (7)

It should however be noted that the pulp and paper industry in the region does have some small scale interpreneurial operations particularly when waste paper

and agricultural residues/non wood plants are maximally exploited. But for the effective utilisation of the existing raw materials to improve the capacity utilisation of the existing raw materials to improve the capacity utilisation of existing mills, to insure timely commissioning of plant installations, to improve regional and subregional self sufficiency and eventually to conserve the scarce foreign exchange by reducing import of pulp, machinery etc, It is vital to establish training institutions which could assist in the alleviation of the above mentioned situations.

It is worth pointing out that the absence of any such institution in the region is responsible for the fact that most mills in Eastern/Southern Africa are manned by expatriates which aggravates some or most of the situations in at least one way or the other.

Note : Southern Africa in this paper refers to Malawi, Mozambique, Swaziland, Zambia, Zimbabwe and not the Republic of South Africa.

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Table I

Consumption and production of paper/paper board within Africa.

Region	Consumption per cent	Production capacity per cent
Northern Africa	52	47
West Africa	20	22
East & Southern Africa	18	31
Central Africa	2	"

— — not available

Pulp and Paper Industry in E. Africa

Table II lists the existing mill, types of raw materials, demand and consumption capacities in (Nine) selected Eastern & Southern African countries.

The real demand for paper is not satisfied as it is strongly restricted, primarily by serious shortage of foreign exchange to import adequate quantities. It should also be kept in mind that there is still a significant portion of the population in this region that practically does not use paper. Demand for paper and paper board strongly depends on the general economic situation; on whether the national budgets will continue to emphasise educational programs and start allocating required resources for their execution; whether foreign currency deficits will ease and thus allow for large sums to be spent on importing paper; whether domestic production of paper will increase and be able to meet a large portion of the demand and; whether the industrial and agricultural sectors will develop favourably and continue to upgrade the packaging standards.

The demand for cultural paper grades will be fastest due to the emphasis in mass literacy. However, the growth of industrial paper grades, i. e. wrapping and packaging and other industrial types of paper and paper boards is likely to grow in the short term due to the generally improved economic conditions.

It is going to be rather difficult to improve self-sufficiency with respect to paper and paper board in this region during this century. The situation might not improve much even well into the next century. Presently only Kenya and Zimbabwe come close to producing domestically significant portions (90-100%) of the paper and paper board used in their respective countries. Even then, the demand in these countries is still restricted.

Project proposals to establish/expand the pulp/paper and paper board production have recently been initiated in many African countries. The objectives which are common to most of the projects are :

- 1) to assure a steady supply of the vital commodity;
- 2) to conserve the scarce foreign exchange—reducing imports;
- 3) to utilise local raw materials (forests and agricultural residues);
- 4) to create employment and
- 5) to earn foreign exchange by exporting in some cases

Obviously, the success of these projects will depend largely on the availability of skilled, semi skilled and technically qualified staff from within the region.

Existing Training Institutions

Table 3 lists the various universities in this region. (6)

Of these universities Sokoine University in Tanzania has a department of wood Utilisation, and Moi University in Kenya has a department in wood Science and Technology which offer related courses to pulp and paper manufacture as well as utilisation. Moi University's department of Wood Science and Technology has a more intensive and elaborate program and offers the following related courses as part of the training :

- 1) pulp production
- 2) pollution and control in wood based industries
- 3) pulp and paper products
- 4) paper science
- 5) cellulose chemistry
- 6) effluent treatment

In addition to these courses, the training incorporates industrial attachment to various pulp and paper industries for practical experience and skill development. The Department was tailored to produce approximately 30 graduates per year. It should however be noted that these graduates are not fully fledged pulp and paper technologists and therefore still require additional (possibly on job) training.

Discussion and Conclusion

Industrial development and training are mutually dependent. With the growing population of the countries in Eastern and Southern Africa, the demand for domestic/cultural grades and even other grades of paper

Table II—Data on present position on Pulp & Paper Industry in Nine Eastern/Southern African countries

Country	t/a consumption	t/a Demand fore- cast 1990 a/	Consumption per capita in kg.	No. of mills	Raw material
a) Ethiopia	25,000	44,000	0.5	2	waste paper, reed imported pulp
b) Kenya	123,000	170,000	7.0	6	waste paper, wheat straw, wood
c) Malawi	15,000	20,000	2.0	3	wood, rice straw
d) Mozambique	13,000	25,000	1.0	2	waste paper rice straw, bagasse
e) Swaziland	160,000	n.a.	20	3	wood waste paper
f) Tanzania	30,000	50,000	1.5	8	wood waste paper, sisal imported pulp, domestic pulp
g) Uganda	30,000	45,000	1.5	1	waste paper, imported pulp, wood
h) Zambia	15,000	33,000	2.0	3	waste paper, imported pulp
i) Zimbabwe	9,600	122,000	11.0	9	wood, waste paper imported pulp

t/a metric tons / annum

a/ highly optimistic forecast

n.a. not available

Table III—List of University in nine Eastern/Southern African countries

Country	No. of University	Paper Technology	Agriculture	Crop Science	Forestry	Engineering
Ethiopia	Addis Ababa Uni.	—	+	—	—	+
	Agricult. Uni. of Alemaya	—	+	—	—	+
Kenya	Nairobi Uni.	—	+	+	—	+
	Kenyatta Uni.	—	—	—	—	—
	Moi Uni.	+	—	—	+	+
Malawi	Uni. of Malawi	—	+	+	—	+
Mozambique	Mondlane	—	+	—	—	+
	Eduaro Uni.	—	—	—	—	—
Swaziland	Uni. of Swaziland	—	+	+	—	—
Tanzania	Uni. of Dar-es-Salaam	—	—	—	—	+
	Sokoine Uni. of Agriculture	—	+	+	+	+
Uganda	Makerere Uni.	—	+	+	+	+
Zambia	Uni. of Zambia	—	—	+	—	+
	Copperbelt Uni	—	—	—	—	—
Zimbabwe	Uni. of Zimbabwe	—	+	+	—	+

— Subject not offered

+ Subject offered

Uni. — University

is bound to rise. To satisfy this demand there will be need to improve production of not only paper qualities and quantities but also of pulps. This will call for industrial development which must go along with training of appropriate manpower to effect the development as well as to man and maintain the industries.

The introduction of paper technology and relevant courses should not be an extremely difficult exercise given that most of the universities in these countries already have well established engineering, agricultural, forestry and crop science programs. Table III.

Training for industrial development should be directed towards improvement/modernisation of the existing mills and establishment of new/more industries. This exercise requires a good engineering background knowledge. As can be seen from Table III, almost all the universities have a Provision for this basic prerequisite.

As stated earlier, the exploitation of such abundantly available raw materials as Agricultural residues and other non woody plants as well as waste paper is minimal. Due to their nature of distribution, their effective exploitation may be achieved by employment of small scale mills. The programs should therefore be directed towards the management and maintenance of small scale mills operating on such raw materials bearing in mind the associated technical problems they pose and the necessary engineering concepts.

The existing universities already do offer some if not all, the basic requirements for appropriate training in all these aspects. Although none of them is directly offering training in pulp and paper technology. If training could be effected, then this region could boast of a large production of pulp, paper and their related products, a move which could not only help to greatly conserve the hard earned foreign exchange but contribute towards its earning instead.

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