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THE AFRICAN BUILDING MATERIALS INDUSTRIES

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THE BUILDING MATERIALS INDUSTRIES IN AFRICA^{1/}

It is recognized that the building materials industry plays a key role in the development process, particularly in the development of the industrial sector. From this point of view the present capacity of the African building materials industry is far from satisfactory, as about 50 per cent of the value of the continent's consumption of building materials is imported. This is an average for Africa, indicating that in some of the individual countries the situation is even worse. Recent trends do not indicate any substantial changes in the situation.

The gross national product of the African continent ^{2/} was estimated to be about US\$23 billion in 1965. Approximately one-twelfth of this, or almost US\$2 billion, represented investment in construction, i.e., buildings and other construction works. Generally, about 40 per cent of the gross output of the construction industry is value added and 60 per cent is expenditure on intermediary inputs. In 1965, the expenditure on building materials and components amounted to US\$1.1 billion. The share of imported materials has been estimated to be more than 50 per cent, which means that African countries spend annually about US\$600 million on imported building materials. It is worth noting that, in the worst cases, these imports cost four to five times as much as in the country of origin, because of extensive transport, extra handling and profits, premium for insurance to cover breakage or loss, etc.

If the current construction costs could be cut down by one-tenth by using locally produced materials, and the savings thus effected were invested in expanding local production, the countries would be self-sufficient within a few years without any burden on their investment plans. In addition, they would be able to reduce the pressure on their very limited resources of foreign exchange. The table below illustrates the benefits of an economic policy along these lines, compared to a continuance of the existing production level.

The figures in the right-hand column (Table 1) show that as a result of a 10 per cent reduction in construction costs the total savings in 15 years on construction investment would amount to about US\$6 billion, or almost double the amount needed to secure a domestic production worth US\$3.6 billion.

The projections for 1980 are based on the ECA estimates for the four sub-regions, and are based on the assumption of an annual rate of growth of 6 per cent for the gross domestic product. Investment in construction is assumed to grow at the rate of about 10 per cent per annum from 9 per cent of the gross domestic product in 1965 to about 15 per cent of the gross domestic product in 1980.

^{1/} Prepared for the UNIDO Inter-regional Workshop on Building Industries, Moscow, Sept-Oct 1968.

^{2/} Excluding Southern Africa.

Table 1 : Benefits of a ten per cent reduction in construction costs
(Value figures in million US\$)

	1965	1980	Cumulated over the period
GDP	22,980	54,430	
1. Investment in construction	1,980	8,800	80,850
Expenditure on building materials	1,100	4,800	44,250
of which imported	600	4,300	36,750
2. Investment in construction	1,980	8,000	74,850
Expenditure on building materials	1,100	4,400	41,250
of which imported	600	800	10,500

PRODUCTION AND CONSUMPTION OF BUILDING MATERIALS

A. Domestic production

Annex I to this paper gives a broad indication of the position of each African country in regard to the production of building materials and related industries. It may be noticed that the building materials industry in Africa at present is largely confined to the processing of bulk building materials such as clay products, cement, cement products and wood, whereas production of building components, fittings and fixtures, sheet glass and asbestos cement is in its infancy. Most of the existing industries are concentrated in the North African countries.

B. Present structure

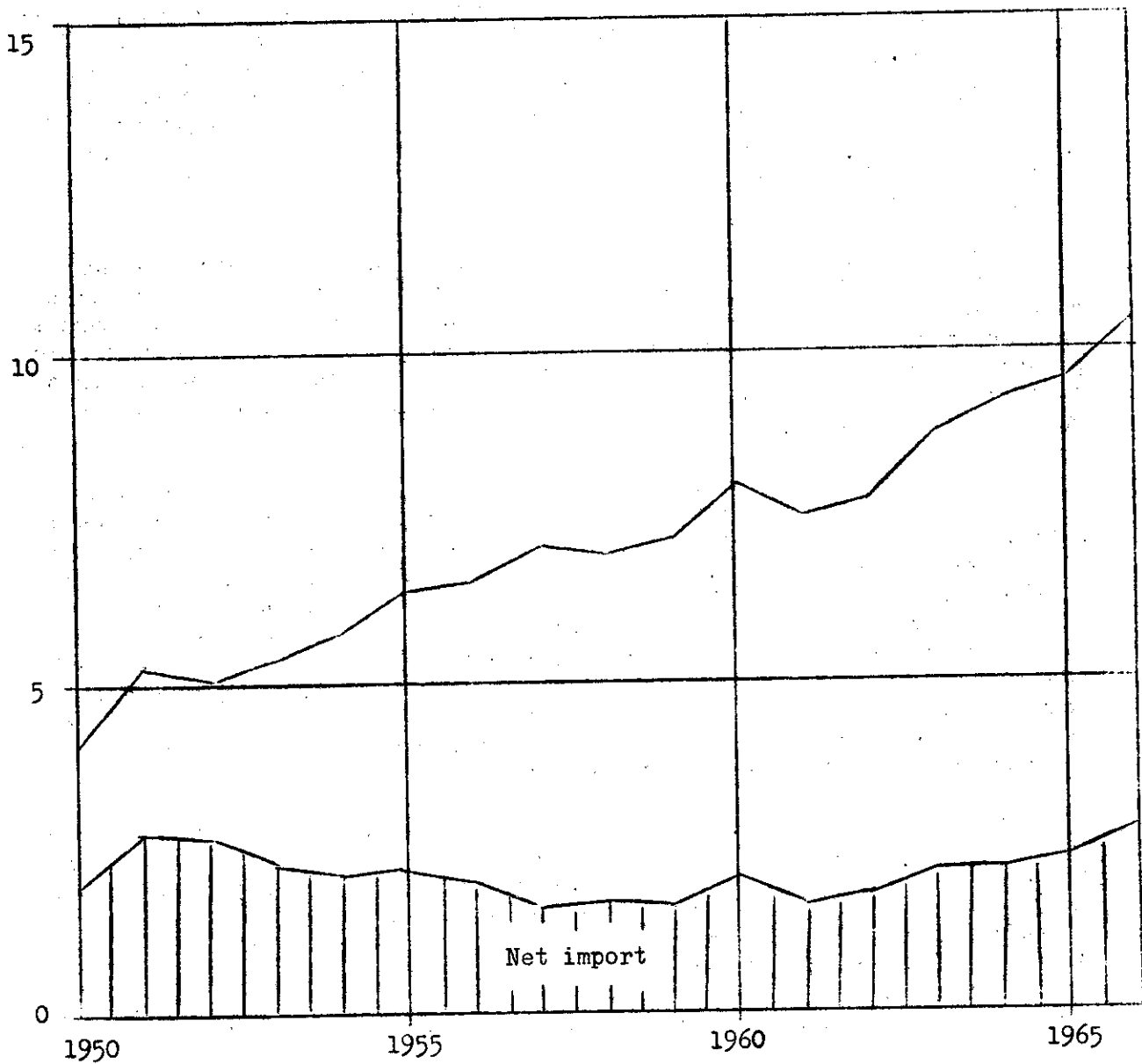
Cement

Consumption of cement or rather cement-based building materials in Africa is rapidly increasing in proportion to the total consumption of building materials. Because of their unique technical properties, such as the almost unlimited flexibility and resistance to organic subversive forces, they are very suitable to specific African needs. The trend is reflected in the graph overleaf, showing the increase in cement consumption. While consumption of cement doubled in 13 years from 1950 to 1963, production doubled in six years. In 1966, the net import of cement accounted for about 26 per cent of the consumption.

CONSUMPTION AND IMPORT OF CEMENT IN AFRICA
(million tons)

GRAPH

Million tons



The spurt in cement production started in the beginning of the fifties, when new large plants were set up, mainly in the countries of the North African sub-region where the industry was already in existence and some smaller units were installed in other countries. Today, more than 60 cement factories are operating on the continent besides a number of clinker grinding plants. Still, the geographical distribution of production is uneven. The North and Eastern African sub-regions are almost self-sufficient, whereas the Central and Western African sub-regions have to rely on imports for about half of their requirements - representing nearly 70 per cent of the total continental imports. Cement prices in some of the hinterland countries tend to be up to four times the world market price irrespective of production in local coastal areas or imports from outside Africa. This problem has arisen from the lack of adequate transport facilities which impede inter-regional trade.

About three-quarters of the African cement plants have each a capacity of above 100,000 tons per annum. This is favourable from the point of view of rentability, but in view of the rather small size of the national markets in some countries of the West and Central sub-region, a number of small size plants properly dispersed, would be better suited to meet the requirements of these countries. Imports might then be restricted to special cements such as white cements.

During the years of uncertainty immediately preceding and following independence investment activities in African countries slowed down considerably. This was reflected in the volume of construction and therefore also in the consumption of cement (see above diagram). During this period many of the plants operated at 50 per cent of their capacity, and the installed capacity is still not completely utilized. It must, however, be kept in mind that some of the cement plants which were set up specifically to meet the requirements of large contracts (large dams) were depreciated when the contracts were completed and stopped working. These and other capacities which have not been utilized for several years can no longer be considered as possibilities for expansion of production.

In general, African cement is rather expensive, but the specific African conditions that tend to inflate prices (e.g., high transport costs of machinery, raw materials and finished products) do not wholly justify the prevailing high levels. The share of "value added" on the gross output of cement is extremely high. Data from official censuses indicate that in 1961 the "value added" in cement factories in Kenya and Rhodesia was 61 and 56 per cent respectively. The high cost of expatriate employees and high profits are two of the important factors responsible for this situation.

If the share of value added was brought down to the normally prevailing level in developed countries of 40 per cent it would, for the same costs of intermediary inputs, reduce the price of cement now sold for \$30 per ton to about \$20 per ton.

Example: Intermediate inputs (40%) \$12 or (60%) \$12

Value added (60%) \$18 or (40%) \$8

\$30 or \$20

Though some development has taken place in African cement production and consumption, it has not been in step with the development of the average world consumption. Annex II compares African cement consumption per capita since 1950 with the world consumption. In 1950, the per capita consumption of all African sub-regions was lower than that of the world, but still it represented an average of 55 per cent of the same. During the period 1950-1966 African per capita consumption rose but not as fast as that of the world. This resulted in a widening of the gap between African and world consumption levels, so that in 1966 African per capita consumption of cement was only 34 per cent of world consumption. But as concrete products are gaining more and more popularity and the investment climate is improving, this gap should tend to narrow down within the foreseeable future.

Cement products

Almost all African countries produce cement and concrete products. The size of the industries and the degree of mechanization varies from country to country.

In North Africa, concrete blocks are largely replacing the traditional, not usually very durable, building materials. They are, to a large extent, produced by small manufacturers and by the contractors themselves who use mobile equipment for the purpose at the construction site itself. In addition to concrete blocks, there is a whole range of other cement products - from asbestos cement to prefabricated, pre-stressed structural elements. Because of the availability of local cement, there is here a high level of utilization of cement products. A similar situation can be observed in the Eastern African sub-region. But, this is not the case in the West and Central African sub-regions. The main consumption of concrete products is in the form of concrete blocks and other products which do not require considerable investment in production facilities. The former enjoy popularity among contractors also as they can be manufactured with mobile equipment right on the building site. In spite of the fact that traditional materials, like clay bricks, are often cheaper and sometimes better, this situation exists because, in the absence of an authoritative quality control on building materials, the contractors often tend to deviate from the specifications for the use of cements with a view to earning larger profits.

The future development of this industry should be directed towards the installation of asbestos cement units and extension of units producing primary building materials such as blocks, tiles and tubes, in order to bring about a substantial reduction in prices to the benefit of the large housing and building programmes that most countries have in mind. At a later stage, efforts should be made to prefabricate large size standardized structural elements in order to increase the productivity of the construction sector.

Sand, gravel, aggregates and cut stone

Quarries for sand and aggregates are found in all African countries, usually a relatively high number of small quarries in or near population centres. Where quarries are located in agricultural areas, a better use of some of the land could be made for agriculture by concentrating excavation in a few larger quarries.

In areas where limestone or similar workable stones are available, cut stones are used in housing and other construction works, but they are, in general, unable to compete with concrete blocks.

Clay and ceramic products

The brick industry is still the most widespread building materials industry on the continent (see Annex I). The manufacture of bricks, especially solid bricks, is a very old tradition in many African countries and the same old artisan methods are persistent, even now after modern industrial methods have been introduced. The artisan-produced bricks range from poor to acceptable quality but are very inexpensive and therefore extremely competitive in relation to more durable walling materials, such as concrete blocks and industrially produced bricks. They are mainly used in rural areas and in low-cost housing.

The best working brick factories are found in North Africa where they cover the local demand adequately. East Africa has a well organized burnt clay industry producing at its capacity level.

Wood products

There are plenty of high closed forests in Africa, West and Central Africa together accounting for more than 75 per cent of the share. For some Central African countries wood represents 70-80 per cent of their total exports and it is generally the precious wood species used for veneers, etc. that are in demand. Most of the wood is, however, exported in logs. This suggests the possibility of establishing profitable industries to process a good part of the vast timber resources. The local construction industry derives its supplies of raw material from branches of exported logs and from a number of lighter wood species. Only the North African sub-region imports almost all its requirements of sawn wood from Europe.

Diagram 3a in the Annex gives a picture of the consumption of wood products in the different African sub-regions. It shows that North Africa has the highest consumption of processed woods (sawn wood and panel products), whereas the West (including Central) and Eastern sub-regions lead in the consumption of round wood.

Although Africa is a net exporter of timber at present, the situation may be reversed in the near future. Imported cheap coniferous timber (whose CIF price is about half the FOB price of the exported species) should replace

the valuable qualities currently in use, if the present volume of exports is at least to be maintained and if, at the same time, the fast growing demand for timber in the construction sector is to be satisfied.

Of course, there are several timber species growing in Africa whose suitability for construction purposes is not yet properly known. Presumably, several of them can be used so that it may not be necessary to depend on imports at all. Studies to determine their suitability and the formulation of adequate policies designed to promote their future use (and abolish present prejudices against them) are, however, needed.

Iron and steel products

Only three countries in the African sub-region have integrated plants producing steel from ore. Tunisia has an annual production of about 80,000 tons. The UAR produces about 500,000 tons and is about to expand its capacity to one million. Rhodesia produces 100,000 tons of steel and 150,000 tons of pig iron for export. Their combined output accounts for 20 per cent of the total African consumption excluding South Africa. Small scrap-melting and re-rolling plants are found in Ghana, Nigeria, Uganda and Ethiopia.

About 75 per cent of the consumption is for construction purposes, reinforcement bars taking the largest share. Reinforced concrete is a major construction material in Africa. Construction steel, such as profiles and plates is only used in large span bridges and buildings and in tanks for storing liquids, grains, etc. A lot of steel components like nails, fencings, grills, meshes and other fittings (tubes, pipes and sanitary wares) are used in construction works in Africa.

Local production, usually based on imported finished or semi-finished products, is directed towards the fabrication of components such as steel windows and door frames, gates, drainage items, etc., rather than towards building materials like rods, profiles and corrugated sheets for which also the demand is very high.

A few countries have taken preliminary steps to produce some of the most needed iron and steel products. Small re-rolling plants are operating in a number of countries and therefore the ground for more extensive manufacture of iron and steel products is being prepared.

In 1964, only 565,000 tons out of the total consumption of 2,500,000 tons was met from local production. The imports of iron and steel products worth US\$233 million in the year thus amounted to double the amount spent on imports of cement.

DEVELOPMENT PROBLEMS AND POSSIBILITIES

(a) Raw materials

Africa is not lacking in any of the major raw materials for the manufacture of building materials. As a matter of fact, large quantities of such raw materials are exported for processing and consumption in other parts of the world. Information on African production of such raw materials is presented in Table 2 below. However, this may not adequately represent the availability of resources, because many known resources are not yet exploited.

Table 2 : African production of basic raw materials required in the building materials industry, 1965

	Unit	North	West	Central	East	Other African countries	Total
Asbestos	1000t	3	-	-	160 ^{a/}	256	419
Gypsum	1000t	696	2	-	42	318	1058
Iron ore (Fe content)	1000t	3083	15524	-	824	5146	24577
Kaolin	1000t	48	-	-	20 ^{b/}	40	110 ^{b/}
Limestone	1000t	7820 ^{b/}	1200 ^{b/}	300 ^{b/}	1184	8559	19063 ^{b/}
Roundwood	mil.m ³	24	57	25	61	14	213

Sources: UN Statistical Yearbook 1965 and 1966.

Mineral Yearbook, vol. IV, United States, Bureau of Mines.

^{a/} Rhodesia only.

^{b/} Estimates.

As regards other non-metallic resources for the manufacture of ceramics and glass, almost no production data are available. Deposits of high grade silica sands for glass manufacture and clays for ceramics are reported to be found in countries of all the sub-regions, but further studies would be required to assess the extent, quality and feasibility of economic exploitation of such deposits.

The abundant resources are, however, not evenly distributed over the continent. The above table indicates a production of 24 million m³ round wood in the North African sub-region, of which Sudan alone accounts for 22 million. Similarly, the Central African sub-region is relatively less endowed with limestone.

The crude materials group (SITC 2) accounts for a large share of African exports. In Central Africa, for instance, it accounts for 35 per cent of the value. Value comparison of regional imports of certain finished goods with the exports of raw materials from which such goods are made shows import/export imbalance. For example, in 1964 import of finished steel products (1.9 million tons) amounted to \$233 million, whereas the export of iron ore (14.7 million tons (Fe content)) was about \$150 million. Generally, on the basis of an expanded inter-regional or multinational co-operation it might be feasible to set up a number of industries to process a large part of the available raw material resources, and thus to help in establishing a balance in the continent's foreign trade.

(b) Plant size requirements

In most of the African countries total consumption of building materials is above the minimum capacity of a modern building materials factory. But as the distribution network is often inadequate, centralization of production in one or few factories would create enormous difficulties in supplying the more remote parts of the countries.

Naturally, the problem is very complex, and many factors have to be considered before choosing the location and the size of a new plant. Special conditions exist in the land-locked countries where prices of imported building materials are so high that small-scale factories with their relatively high overheads could be competitive. However, this should not stop governments of these countries from aspiring for optimal solutions through sub-regional co-operation.

Because of the position of raw materials and the size of markets it is necessary for certain industries to base their production capacities on a sub-regional or regional basis. This involves sharing out of industries among different countries within the framework of a programme of sub-regional co-operation in which interchange of products like sheet glass, iron and steel, refractories, asbestos cement, etc. could take place.

(c) Cost of production and prices

Naturally the main purpose of all studies preceding the setting up of a new plant is to determine locations which would offer the lowest possible costs to the producers and the lowest possible prices to consumers. However, under African conditions it may not always be possible to aim at cost and price situations which are obtained in developed countries.

Several factors tend to increase the expenses incurred in setting up a factory in Africa. Since most of the machinery and equipment come from countries outside Africa, they carry higher transport cost and higher insurance premia. Similarly, the erection and running-in of a factory is usually done by expatriate firms whose employees draw high salaries and allowances and whose costs are high. It is often necessary to provide housing and social facilities for the employees.

Another set of factors that contributes to higher costs are the inputs. The prices of material inputs, imported materials in particular, are generally high. Depending on the location, land, electric power and fuel could also be expensive. An African factory needs a larger capital in the form of stocks of raw materials and spare parts because delivery from abroad is often unreliable and slow. In addition, the profits and expenditure on salaries - mainly those of the expatriate employees - are often extremely high.

All this is reflected in the high prices of cement. A remarkable feature of the cement price structure in African countries is the wide range of its variations. Some indication of this can be had from the data on cement prices in some of the East African countries which are presented in the following Table 3. Though the data are not on a uniform basis and therefore not strictly comparable they are illustrating enough. It may be noted that the world market price of cement in 1965, the year to which the East African prices given in the table relate, was only US\$16 per ton.

Difficult as the problem of reducing the high costs might seem, concerted efforts must be made to tackle it. Savings must be achieved in the individual components of cost. There are several ways in which these could be effected.

Some of the more conspicuous fields where efforts to reduce costs would be most profitable are manpower and investment in equipment. Urgent measures to train local manpower and personnel should be taken in order to avoid or, at least reduce to the minimum, employment of expatriate experts and reduce the high number of unskilled labourers employed in many plants. Careful studies and research must precede erection of new plants so as to ensure appropriate selection of equipment of technical processes that would yield maximum operation efficiency under African countries. There are possibilities of starting the manufacture of relatively simple components of the building materials fabricating units. They need to be investigated. The local manufacture of components for making bricks, concrete blocks and tubes, sawnwood, etc., should be encouraged.

Table 3 : 1965 prices of cement in some East African countries

Country	City	Price US\$/t	
Ethiopia	Addis Ababa	40.25	Ex-factory
Kenya	Mombasa	26.46	Delivered sales agent
	Nairobi	33.74	" " "
Madagascar	Tananarive	51.65	Imported from France
	Ambeanio	35.49	Ex-factory
Malawi	Zomba	36.64	"
Mauritius	Port-Louis	21.28	CIF imported from Kenya
Rwanda	Kigali	63.00	Imported from Uganda
Uganda	Tororo	34.86	Ex-factory
Zambia	Lusaka	19.60	"

Governmental intervention to ensure free competition and this to lower profits to a reasonable level would also be necessary. Otherwise the benefits of concessions like exemptions from customs and taxes, granted to new factories in Africa, will not reach the consumer.

PROJECTIONS FOR DEVELOPMENT

Construction industry plays an important role in any country's economic activity. Investment in construction represents an almost constant share of the fixed capital formation, irrespective of the national priorities for development. The share fluctuates from country to country between 50 and 70 per cent of the GDFCF and tends to decrease as the ratio of GDFCF to GDP increases, because the replacement rate of existing houses and other construction works is very low compared to that of machinery and equipment. Investment in construction is composed of four basic parts:

1. Investment in dwellings;
2. Investment in non-residential building for the productive sector;
3. Investment in non-residential building for the social sector;
4. Investment in infrastructure.

The shares of investment among these sectors, inter se, are greatly influenced by governmental policies and sources of finance, and are therefore sensitive to political and economic changes in a country. The indigenous private financiers tend to invest mainly in dwellings and commercial buildings (shops, factories, hotels, etc.), whereas public investment is directed largely in infrastructure works (roads, main services, railways, etc.), and residential buildings of a social and public character, such as educational, health and administrative institutions.

Because of the rapid expansion of population and its migration towards the cities, coupled with the fact that private investors tend to concentrate their interest on the more expensive types of dwellings yielding high rents, there is a widespread need for low-cost housing in almost all African countries. It is, therefore, necessary for governments to start promoting extensive low-cost housing programmes either through national housing schemes or by providing funds for such programmes. This has already started in some countries, but it is still on too small a scale.

Assuming that 50 to 70 per cent of the fixed capital formation will be in construction investment, a projection of investment in construction in Africa for 1980 has been made ^{1/}. It is presented in Table 4, along with comparable figures for 1965.

^{1/} The projections are based on growth rates that are higher than the actual rates achieved by the sub-region during 1960-1965. But seen in the light of the urgency of accelerating African development they are not unreasonable. The sub-regional rates of growth of GDP per capita over 1964-1980 on which the projections are based are: North Africa, 3.1 per cent; Eastern Africa, 3.0 per cent; West Africa, 3.4 per cent; and Central Africa, 3.5 per cent.

Table 4 : Gross domestic fixed capital formation in construction, and its share in GDP, 1965-1980

(value figures in million US\$)

	1965			1980		
	GDP	FCF in construction	2 to 1 %	GDP	FCF in construction	5 to 4 %
	1	2	3	4	5	6
North	7,370	591	8.0	18,800	2,644	14.1
West	9,550	788	8.2	22,530	3,461	15.4
Central	2,522	173	6.9	6,689	804	12.0
East	3,534	424	12.0	8,410	1,171	13.9
4 sub-reg.	22,976	1,976	8.6	56,429	8,080	14.3

According to these projections the construction industry in Africa can be expected to have an enormous scope for development. If this development is to be realized, certain conditions would have to be met. First, government policies should aim at creating favourable conditions for local contractors and ensure efficient organization and management of the construction industry. Secondly, intense efforts must be made to improve the output of the African building materials industry, both qualitatively and quantitatively. This would involve establishment of multinational and sub-regional projects. Thirdly, efforts must be made to lower building costs, not only through reduction of the price of building materials, but also through increasing labour productivity in the construction sectors and by standardization of the construction elements and repetition of operations. Finally, establishment of an African Geological Institute to prepare a detailed catalogue of the raw materials - for building industries - available in Africa, and a geological map for the whole continent, as well as organization of testing laboratories on a country basis, would also be of great value.

ANNEX I

Domestic production of building materials and related industries^{1/}

Number of countries by region and total	Country	Cement	Cement products	Asbestos cement products	Clay products	Iron and steel works (Integrated plants)	Iron and steel products	Non-ferrous metals	Worked wood	Plywood	Paints and varnishes (mixing and production)	Sheet glass	Electrical fittings, fixtures	Sanitary ware	Sanitary fittings
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<u>North Africa:</u>															
	Algeria	X	X	X	X	-	X	X	X	-	X	X	X	-	..
	Libya	-	X	-	X	-	..	..	..	-	..	-	-	-	-
	Morocco	X	X	X	X	-	X	X	X	X	X	-	X	X	X
	Sudan	X	X	-	X	-	..	..	X	-	..	-	-	-	-
	Tunisia	X	X	X	X	X	X	X	X	-	-	X	-	X	..
	UAR	X	X	X	X	X	X	X	X	-	X	X	X	..	..
6	Sub-totals	5	6	4	6	2	4	4	5	1	3	3	3	2	1
<u>West Africa:</u>															
	Dahomey	-	..	-	X	-	..	-	X	-	-	-	-	-	-
	Gambia	-	X	-	X	-	..	..	X	-	-	-	-	-	-
	Ghana	-	X	-	X	-	X	X	X	X	X	-	-	-	-
	Guinea	-	X	-	X	-	..	X	X	-	..	..	..	..	..
	Ivory Coast	-	X	-	X	-	X	-	X	X	-	-	-	-	-

^{1/} Note: Presence of building material X; Absence of building material -;
No information available ..

Domestic production in the building materials and related industries^{1/} (cont.)

Number of countries by region and total	Country	<div>Cement</div> <div>Cement products</div> <div>Asbestos Cement Products</div> <div>Clay products</div> <div>Iron and steel works (Integrated plants)</div> <div>Iron and steel products</div> <div>Non-ferrous metals</div> <div>Worked wood</div> <div>Plywood</div> <div>Paints and varnishes (mixing and production)</div> <div>Sheet glass</div> <div>Electrical fittings, fixtures</div> <div>Sanitary ware</div> <div>Sanitary fittings</div>													
		3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Liberia	-	X	-	X	-	-	-	X	-	-	-	-	-	-
	Mali	-	X	-	X	-	..	-	..	-	-	-	-	-	-
	Mauritania	-	..	-	..	-	..	..	..	..	..	-	-	-	-
	Niger	-	-	-	X	-	-	-	-	-	-	-	-	-	-
	Nigeria	X	X	X	X	-	X	-	X	X	-	-	X	-	-
	Senegal	X	X	..	X	-	X	-	X	-	X	-	-	-	-
	Sierra Leone	-	X	-	X	-	-	-	X	-	X	-	-	-	-
	Togo	-	..	-	X	-	..	-	X	-	..	-	-	-	-
	Upper Volta	-	..	-	X	-	..	-	..	-	..	-	-	-	-
14	Sub-totals	2	9	1	13	0	4	2	10	3	3	0	1	0	0
	<u>Central Africa:</u>														
	Angola	X	X	..	X	-	X	X	X	..	..	-	-	-	-
	Cameroon	-	X	-	X	-	X	X	X	X	-	-	-	-	-
	Central African Republic	-	..	-	X	-	..	-	..	-	-	-	-	-	-
	Chad	-	..	-	..	-	..	-	..	-	-	-	-	-	-

^{1/} Presence of building material X
 Absence of building material -
 No information available ..

Domestic production of building materials and related industries^{1/} (cont.)

Number of countries by region and total	Country	<div>Cement</div> <div>Cement products</div> <div>Asbestos cement products</div> <div>Clay products</div> <div>Iron and steel works (Integrated plants)</div> <div>Iron and steel products</div> <div>Non-ferrous metals</div> <div>Worked wood</div> <div>Plywood</div> <div>Paints and varnishes (mixing and production)</div> <div>Sheet glass</div> <div>Electrical fittings, fix- tures</div> <div>Sanitary ware</div> <div>Sanitary fittings</div>													
		3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Congo (Braz.)	-	X	-	X	-	X	X	X	X	X	-	-	-	-
	Congo (Kinshasa)	X	X	..	X	-	X	X	X	X	X	-	..	..	..
	Gabon	-	..	-	X	-	-	-	X	X	-	-	-	-	-
7	Sub-totals	2	4	0	6	0	4	4	5	4	2	0	0	0	0
<u>East Africa:</u>															
	Burundi	-	X	-	X	-	..	..	..	..	-	-	-	-	-
	Ethiopia	X	X	-	X	-	X	-	X	X	-	-	X	-	-
	Kenya	X	X	X	X	-	X	X	X	-	X	-	X	-	-
	Madagascar	X	X	..	X	-	..	..	X	-	..	-	-	-	-
	Mauritius	-	X	-	X	-	-	-	-	-	-	-	-	-	-
	Mozambique	X	X	..	X	-	..	..	X	X	..	-	..	..	-
	Nyasaland	X	X	..	X	-	..	..	X	-	..	-	-	-	-
	Northern Rhodesia	X	X	X	X	-	X	X	X	..	..	-	X	X	..

1/ Note: Presence of building material X
Absence of building material -
No information available ..

Domestic production of building materials and related industries^{1/} (cont.)

Number of countries by region and total		Cement	Cement products	Asbestos cement products	Clay products	Iron and steel works (Integrated plants)	Iron and steel products	Non-ferrous metals	Worked wood	Plywood	Paints and varnishes (mixing and production)	Sheet glass	Electrical fittings, fixtures	Sanitary ware	Sanitary fittings
1	Country	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Rwanda	-	X	-	X	-	..	..	..	..	-	-	-	-	-
	Somalia	-	X	-	..	-	-	-	X	-	-	-	-	-	-
	Southern Rhodesia	X	X	X	X	X	X	X	X	..	X	..	X	X	..
	Tanganyika	-	X	-	X	-	-	X	X	X	X	-	-	-	-
	Uganda	X	X	X	X	-	X	-	X	X	-	-	-	-	-
13	Sub-totals	8	13	4	12	1	5	4	10	4	3	0	4	2	0
40	Grand totals	17	32	9	37	3	17	14	30	12	11	3	8	4	1

1/ Note: Presence of building material X
 Absence of building material -
 No information available ..

ANNEX II

Cement consumption per capita in Africa and in the world

	NORTH AFRICA		WEST AFRICA		CENTRAL AFRICA	
	kgs per capita	Index	kgs per capita	Index	kgs per capita	Index
1950	43	0.78	11	0.20	32	0.42
1955	55	0.68	14	0.17	33	0.41
1957	46	0.53	16	0.18	33	0.40
1958	52	0.57	18	0.20	31	0.34
1959	56	0.57	19	0.19	24	0.24
1960	66	0.63	22	0.21	15	0.14
1961	60	0.55	22	0.20	12	0.11
1962	58	0.55	22	0.19	16	0.14
1963	70	0.60	23	0.20	16	0.14
1964	70	0.56	25	0.20	18	0.15
1965	65	0.50	26	0.20	16	0.12
1966	69	0.50	28	0.20	17	0.12

Cement consumption per capita in Africa and in the world (cont.)

	EAST AFRICA		TOTAL AFRICA		WORLD	
	kgs per capita	Index	kgs per capita	Index	kgs per capita	Index
1950	18	0.33	30	0.55	55	1.0
1955	21	0.26	42	0.52	81	1.0
1957	21	0.24	41	0.47	87	1.0
1958	22	0.24	43	0.47	92	1.0
1959	23	0.23	44	0.45	98	1.0
1960	21	0.20	40	0.38	104	1.0
1961	21	0.19	42	0.38	110	1.0
1962	18	0.16	40	0.34	116	1.0
1963	17	0.15	41	0.35	116	1.0
1964	17	0.14	44	0.35	124	1.0
1965	16	0.12	45	0.34	131	1.0
1966	16	0.12	47	0.34	137	1.0

ANNEX III

African consumption of wood products and their
share in construction (in mill cubic metres)

Wood product	Sub-region	1959/61		1975	
		Total Consumption	Construction share	Total Consumption	Construction share
Sawn wood	West and Central	1.10	0.800	2.400	1.700
	Eastern	0.82	0.520	1.600	1.000
	North	1.00	0.520	1.700	0.900
	4 Sub-regions	2.92	1.840	5.700	3.600
Panel products	West and Central	0.06	0.030	0.154	0.077
	Eastern	0.07	0.035	0.199	0.100
	North	0.11	0.055	0.327	0.160
	4 Sub-regions	0.24	0.120	0.680	0.337
Round wood	West and Central	4.86	3.500	6.610	4.500
	Eastern	4.80	3.500	6.630	4.500
	North	0.43	0.100	0.660	0.200
	4 Sub-regions	10.09	7.100	13.900	9.200
Wood products	West and Central	6.02	4.330	9.164	6.277
	Eastern	5.69	4.055	8.429	5.600
	North	1.54	0.675	2.687	1.260
Total	4 Sub-regions	13.25	9.060	20.280	13.137

ANNEX IV

Cement

SUB-REGIONS	1964				1980			
	Prod.	Imp. - exp.	Cons.	Cons./ cap.	Prod.	Imp. - Exp.	Cons.	Cons./ cap.
NORTH				(kgs)				(kgs)
Quantity 1000 t	4,745	415	5,160	72			13,500	121
WEST								
Quantity 1000 t	965	1,422	2,387	25			12,390	84
CENTRAL								
Quantity 1000 t	250	207	457	18			3,030	82
EAST								
Quantity 1000 t	792	79	871	13			4,460	47
ALL SUB-REGIONS								
Quantity 1000 t	6,752	2,123	8,875	34			33,380	85

E/CN.14/HOU/34
Annex IV

Prefabricated cement products

SUB-REGIONS	1964			1975			1980		
	Prod.	Cons.	Cons./cap.	Prod.	Cons.	Cons./cap.	Prod.	Cons.	Cons./cap.
			\$ - kg			\$ - kg			\$ - kg
NORTH									
Value 1000 \$	22	22	0.50	70	70	1.18	110	110	1.61
Quantity 1000 t ^{2/}	882	882	20	2,823	2,823	48	4,287	4,287	63
WEST									
Value 1000 \$	50	50	0.52	186	186	1.44	470	470	3.18
Quantity 1000 t	2,000	2,000	21	7,500	500	58	16,610	16,610	112
CENTRAL									
Value 1000 \$	3 ^{1/}	3	0.12	23	3	0.70	40	40	1.08
Quantity 1000 t	110 ^{1/}	110	4	923	3	28	1,642	1,642	44
EAST									
Value 1000 \$	5 ^{1/}	5	0.08	13	13	0.15	20	20	0.21
Quantity 1000 t	200 ^{1/}	200	3	520	520	7	800	800	8
ALL									
Value 1000 \$	80	80	0.35	292	292	0.95	640	640	1.84
Quantity 1000 t	3,192	3,192	14	11,766	11,766	39	23,339	23,339	67

1/ Secretariat estimate

2/ Excluding the UAR

Sand and gravel, aggregates, stone

SUB-REGIONS		1964		1975		1980	
		Cons.	Cons./cap.	Cons.	Cons./cap.	Cons.	Cons./cap.
NORTH			kg		kg		kg
Value	1000 \$	50		96		13.2	
Quantity	1000 t	36.1	500	68.5	705	94.0	840
WEST							
Value	1000 \$	23		72		12.1	
Quantity	1000 t	16.7	174	51.5	400	86.7	587
CENTRAL							
Value	1000 \$	4.4		13		30	
Quantity	1000 t	3.2	126	9.0	273	21.2	573
EAST							
Value	1000 \$	8.6		26		43	
Quantity	1000 t	6.1	93	18.8	222	31	325
ALL							
Value	1000 \$	86		207		326	
Quantity	1000 t	62.1	240	147.8	430	232.9	595

Iron and steel products (excluding heating, lighting and plumbing fixtures)

SUB-REGIONS	1964				1975				1980			
	Prod.	Imp.	Cons.	Cons./ cap.	Prod.	Imp.	Cons.	Cons./ cap.	Prod.	Imp.	Cons.	Cons./ cap.
	in kg				in kg				in kg			
NORTH												
Value 1000 \$	46	105	151		288	127	4,515		398	139	537	
Quantity 1000 t	385	880	1,265	17.9	2,400	1,060	3,460	35.5	3,320	1,160	4,480	40.1
WEST												
Value 1000 \$	2	70	72		144	72	216		204	73	277	
Quantity 1000 t	20	580	600	6.2	1,200	600	1,800	14.0	1,700	610	2,310	15.6
CENTRAL												
Value 1000 \$	1	16	17		53	12	65		82	4	86	
Quantity 1000 t	10	130	140	5.6	440	100	540	16.4	685	35	720	19.5
EAST												
Value 1000 \$	18	42	60		127	24	151		172	20	192	
Quantity 1000 t	150	350	500	7.4	1,060	200	1,260	14.9	1,435	165	1,600	16.8
ALL												
Value 1000 \$	67	233	300		612	235	847		856	236	1,092	
Quantity 1000 t	565	1,940	2,505	9.4	5,100	1,960	7,060	20.5	1,140	1,970	9,110	23.2

Remark: Export is negligible.