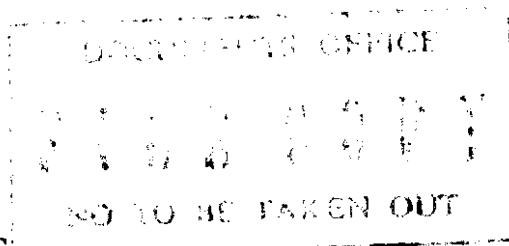




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ECONOMIC COMMISSION FOR AFRICA

REPORT OF THE MEETING OF AFRICAN EXPERTS
ON BUILDING MATERIALS AND CONSTRUCTION INDUSTRIES

Sponsored by
THE ECONOMIC COMMISSION FOR AFRICA
THE UNITED NATIONS CENTRE FOR HUMAN SETTLEMENTS
THE UNITED NATIONS ENVIRONMENT PROGRAMME
and
THE UNITED NATIONS INDUSTRIAL DEVELOPMENT
ORGANIZATION

Held in Addis Ababa, Ethiopia
from 23 to 27 July 1979

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1. INTRODUCTION

A. General

1. After a series of preliminary activities, the Building Materials and Construction Industries Development Programme started in earnest in August 1977 when a team of experts was sent to visit eight African countries.

2. The tasks to be performed by the team can be summed up as follows: to take stock of the situation of the building materials industry in the light of the present and future needs of African countries and the availability of local raw materials and to examine the existing building materials production facilities, the research and development activities and the institutions concerned with these matters; traditional building technology, including construction and building materials and designs and building laws and regulations to see whether they helped or hindered the development of building materials and construction industries. The team was also called upon to make an inventory of studies and reports on on-going or proposed projects or programmes related to human settlements technology and on training and vocational training institutions concerned with the development of manpower for the construction industry with a view to establishing criteria for using existing institutions as a basis for an integrated building materials industry, equipped to meet local needs and, where appropriate, to identify the potential for industrial development aimed at meeting intra-African requirements.

3. The very valuable information gathered and the approximately 70 pilot projects identified by the team of experts along with some pertinent recommendations were the subject of a report, 1/ which was submitted to the Follow-up Committee on Industrialization in Africa at its fourth meeting and to the Conference of African Ministers of Industry at its fourth session, both of which were held in Kaduna (Nigeria) in November 1977. By giving the programme on the development of the building materials and construction industries second priority, immediately after the agro and food industries, the African Ministers wanted not only to show their satisfaction with the work done and encourage the international and intergovernmental organizations which had helped the programme to get off the ground to make more of an effort to work together in this field, but also and above all, to give African States greater responsibility for the development of the sector.2/

4. In the hope of getting member States to participate in the programme as much as possible, the ECA secretariat called on a number of countries to send their own experts to a meeting which was held in Addis Ababa from 17 to 21 July 1978. The meeting had a threefold objective:

- (i) To examine the present situation of the building materials and construction industries; to determine the various elements of the strategy for the promotion of these industries and, in the light of those elements, to recommend a long-term development policy and programme setting various objectives at the national, subregional and regional levels and to specify ways of achieving them;

1/ See document ECA/CMI/FCIA/WP/5.

2/ See resolution 8(IV) of the Conference of African Ministers of Industry.

(ii) To recommend ways of planning activities in the building materials and construction sector in such a way as to integrate them into national plans and to co-ordinate them with development programmes in other economic and social sectors

(iii) To determine the priorities in the formulation of national, sub-regional and regional projects related to the building materials and construction industries.

5. The valuable recommendations adopted by the African experts at that first meeting are expected to serve as guidelines for African Governments in the formulation of national policies and strategies for the development of the sector and in the identification of priority areas and programmes. That was also the view of the Intergovernmental Regional Committee on Human Settlements which considered the recommendations at its first session held in Addis Ababa from 2 to 6 October 1978.

6. The first meeting of African experts on building materials also adopted a special recommendation entitled "Recommendation concerning meetings of experts" requesting ECA in co-operation with the international organizations, inter alia, to convene, with a frequency to be defined, the meeting of African experts on construction and building materials in view of the fact that the meeting of African experts constitutes an appropriate framework permitting the experts to exchange experiences and assess progress made in the sector in Africa and recommend to African States the appropriate corrective measures. This meeting of African experts on construction and building materials is part of the follow-up action aimed at giving effect to the recommendations adopted by the experts at their first meeting.

B. Objectives

7. The building materials and construction industries development programme is still in the first phase (preparatory phase).

8. Since that phase will be completed at the end of September this year, the first objective of the present meeting should be to review and evaluate what has been done so far.

9. It is expected that the activities of the preparatory phase will be followed immediately by a 27-month programme (phase II) consisting mainly of the preparation of sectoral country surveys, country programmes and pre-feasibility studies, the execution of subregional and regional pilot projects and the testing of various mechanisms recommended to encourage and speed up development of the sector. Accordingly, the second objective of this meeting is to discuss the detailed programme for the second phase and recommend appropriate ways of ensuring that it is implemented.

C. Opening of the meeting

10. The meeting of African Experts on Building Materials and Construction Industries organized jointly by ECA, UNCTAD, UNIDO and UNEP was opened officially by Mr. Lopo do Nascimento, Deputy Executive Secretary of ECA, on 23 July 1979 in ECA headquarters at Addis Ababa. The following delegations were present:

(i) Member States of ECA:

Burundi, Kenya, Madagascar, Rwanda, Senegal, the Sudan and Togo^{3/}

(ii) Intergovernmental organizations:

OAU, CEPCL

(iii) National and international organizations:

Bouwcentrum, UNDP, UNIDO, UNKIS, EAO and ECA.

11. In this opening address, after recalling the various decisions taken by African and international officials to promote the development of the building materials and construction industries in Africa, the Deputy Executive Secretary emphasized the importance of that sector. He drew attention to the main objectives of the meeting which were:

(i) To analyse and evaluate the work carried out so far under the regional building materials and construction industries development programme;

(ii) To consider and adopt the detailed plan of action for the implementation of the second phase of the programme (October 1979-December 1981).

12. He recalled briefly that ECA and the international organizations had already done and what they must do in the next few years in order to reinforce the steps taken by the African countries so as to become self sufficient in the sector by the year 2000. He drew particular attention to the need for more active involvement and participation of the various countries in the planned Programme activities.

13. After paying tribute to the organizations which had helped to launch the Programme, he invited the experts to give special attention during their discussions to planned activities in the following fields: rationalization and management of the factors of production, increase and modernization of the production of building materials, promotion of building systems and services and harmonization of the planning and implementation sectors.

D. Election of Officers

14. The following officers were elected:

Chairman:	Mr. Assane DIAGNE (Senegal)
Vice-Chairman:	Mr. Patrick KANYUE (Kenya)
Rapporteur:	Mr. Epaphrodite NINDIATA (Rwanda)

^{3/} Representatives of the following countries arrived later: Egypt, Ghana, Morocco, Sierra Leone and Zaire; and the United Republic of Cameroon as observer.

E. Agenda and organization of work

15. The agenda and programme of work proposed by the ECA secretariat were adopted without amendment.

II. ACCOUNT OF PROCEEDINGS

A. Environmental impact of building materials production and construction activities.

16. The representative of UNCPS introduced a document on behalf of the United Nations' Environment Programme.

17. The primary concern of UNEP in the building materials and construction sector, he noted, is related to the environmental aspects and consequences of exploiting building materials and the kind of environmental ambience achieved when materials are used to create shelter. The human settlements technology programme of UNEP covers four major areas: (a) the interrelationship between the energy sector and the building materials and construction sector, (b) resource recovery, recycling, and use of wastes in the building materials and construction sector, (c) sound environmental practice in extracting building materials, and (d) the interrelationship between building materials and in-door climate. UNEP has adopted a three-tier approach to tackle problems in these four areas involving: identification of gaps in knowledge of action, institution of programmes to deal with such gaps, and establishment of selected projects from the funds of UNEP.

18. He stressed that since UNEP is not an implementing agency, it only plays a catalytic and co-ordinating role which is propagated through a network of leading institutions (9 in Africa) with competence in, among other things, building materials and construction. It is the hope of UNEP that by 1982 a global network of institutions will be entrusted with the task of identifying, testing, demonstrating and publishing environmentally sound human settlements technology, of which building materials forms one part. The ultimate objective, he concluded, is to enable institutions in developing nations to choose and develop building technologies appropriate to their environmental conditions.

19. A discussion of ^{the} paper then ensued. The various contributions dealt with the following points:

(a) Impact of the opening of quarries

It was pointed out that, in most cases, quarries were opened haphazardly without reference to any plan. In the case of clays, in particular, quarries were opened near cities and that definitely hindered the development of urban centres.

Moreover, once exploitation was completed the quarries were abandoned thus endangering the health and safety of the population, both human and animal.

In rural areas, disorderly exploitation of quarries could result in limiting the land available for agricultural purposes.

The experts noted with satisfaction that all these problems were scheduled for discussion at an international symposium on sub-surface soil utilisation to be held in Stockholm in October 1980 and that whatever proposals were decided upon would be reflected in a report which UNOPS would submit to the African countries.

(b) Utilization of wood

It was pointed out that wood has always been a favourite construction material. However, wood was also an inexpensive source of energy, particularly in Africa. These two main uses of wood resulted in unplanned tree felling activities which had an unfavourable impact on the environment (producing, inter alia, ecological and climatic changes and erosion).

Since wood is expected to continue to be one of the main construction materials, the experts felt that, wherever possible, it should be replaced by other materials (peat, solar energy) as a source of energy. In any event, in order to protect the environment it is essential to see to it that areas where the forests have been cut down are replanted with trees.

(c) Geotechnical problems

Some experts stressed that seismic phenomena should be taken into account in any study relating to construction. They also pointed out that this aspect should not be neglected in the training of engineers. In this connexion, participants were informed that UNOPS, UTP and UNEDRO were preparing a manual on reconstruction of settlements following natural disasters.

(d) Environmental impact of the utilization of building materials

The meeting of experts noted that people might be exposed to health hazards of one kind or another due to the use of certain building materials such as cow-dung (in the case of mud houses), rainwater collected from corrugated iron roof and straw roof might also be harmful to the health.

After considering the problems raised by the environmental impact of building materials production, the experts concluded that it would be necessary to:

- (i) plan for the systematic exploitation and re-utilization of quarries
- (ii) replace wood by other sources of energy wherever possible and adopt a policy of systematic reafforestation;
- (iii) take all necessary steps as outlined in various handbooks and documents on seismic effects
- (iv) study in greater detail the environmental impact of building materials and the impact of the latter on building occupants those studies should be carried out by international bodies specializing in the field.

20. Although these proposals call for substantial investment African countries should realize that they are of crucial environmental importance and therefore deserve the greatest attention no matter what the financial implications.

B. Role of the United Nations Centre for Human Settlements in the field of building materials and construction industry and technology in developing regions

21. The representative of the United Nations Centre for Human Settlements submitted a paper on the subject.

22. This paper is devoted to a detailed description of the policy objectives and the on-going and proposed field programmes of UNCHS in order to identify the specific areas in which UNCHS can contribute supplementary support input to the FCA programme for the development of the African Building Materials and Constructions Industries. The centre located in Nairobi came into being on 12 October 1978 under UN General Assembly resolution No. 32/162 to deal with human settlements activities within the UN system according to the six subprogrammes recommended by the Habitat UN Conference on Human Settlements held in Vancouver in 1976.

23. The Centre has made an impressive start and as of 1979, has already to its credit 49 projects in 22 African countries (Algeria, Burundi, Botswana, Cape Verde, Chad, Guinea, Ivory Coast, Lesotho, Libya, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Senegal, Seychelles, Sierra Leone, Sudan, Swaziland, Tanzania, Upper Volta and Zimbabwe) involving a budget of 6.6 million dollars.

The Centre's paper dealt with the following nine areas of activities which could have an operational linkage with the FCA programme: information, training, informal sector, design, building regulations and standards, pilot and demonstration projects, technology, building materials, construction industry.

The detailed projects under each of the above were described in terms of the countries, budget allocation, methodology of execution, project content and duration and extent of its coverage with an indication of the objective and the anticipated impact of each project.

24. The discussion that followed concentrated on the following points:

- (i) The experts stressed the difficulties which African countries encountered in locating and evaluating their raw material resources. The introduction of new techniques based on effective and inexpensive methods of locating and evaluating raw materials (methods for quickly estimating exploitable reserves) and transport of raw materials could lessen the problem and be a first step towards the development of the sector.
- (ii) The experts felt that the absence of a specific policy on the training of skilled manpower also seriously handicapped the development of the sector. The shortage of skilled local labour results in countries having to use foreign labour and this increases production and construction costs.

- (iii) Building design was another very important issue. Unfortunately, no major local initiative had been taken in that respect because the matter was very closely related to other considerations such as codes, regulations and finances. Generally speaking, banks prefer to provide funds only for buildings involving well known materials and types of architecture and that, unfortunately, means those used in Western countries:
- (iv) The experts also referred to the polluting aspect of certain building materials industries, such as cement works.
- (v) Energy consumption in the production of building materials was considered as a crucial factor to take into account when technologies are selected. Moreover, energy consumption in transportation of materials and construction process has a significant influence on the smooth running of the building operations and final costs.
- (vi) Building codes and regulations suitable for developing countries was another subject of discussion. Their relevance to prevailing conditions can influence financial institutions in supporting building activities, as well as in the increased utilization of local raw materials and construction techniques.

25. The conclusions drawn concerning these various problems can be summed up as follows:

- (i) Need to utilize methods such as remote sensing to locate and carry out preliminary evaluations of raw materials reserves
- (ii) Need to adapt training programmes for engineers, architects and technicians at all levels to the realities of the local situation. The programmes should take account of the fact that the work of architects and engineers is complementary and that they must work together very closely right from the design stage
- (iii) Need to adopt a new policy regarding the mobilization and granting of funds to finance construction activities with a view to making the best possible use of locally produced materials
- (iv) Establishment of small building material production units in order to minimize the concentration of pollution caused particularly by large production units.

C. The role of small- and medium-scale building material industries in economic and social development.

26. The experts then listened keenly to the paper presented by a representative of UNIDO. The paper is briefly summed up as follows:

27. In contrast to the meagre attention bestowed on the building materials and construction industry subsector during the first years of industrial development, its importance (its share in GDP is now 4.8 per cent) is increasingly recognized and several agencies are engaged in accelerating

the development of this sector, especially in the context of the Lima Declaration which required a minimum average annual growth rate of 11.6 per cent within the framework of the target of 2 per cent for the African region.

28. However, if this growth is to make any significant contribution towards the improvement of the social conditions of the poorest segments of the population it must incorporate strategies and technologies well adapted to local needs and factor endowments.

29. The present situation is characterized by two distinctly different housing types, i.e., permanent conventional urban houses built by the formal construction industry at high cost and the non-durable traditional sub-standard dwellings mainly situated in rural and urban fringe areas and constructed at very low cost by self-help methods. On this background it is argued that priority must be given to the production of building materials which are durable and inexpensive which can be produced locally using locally available raw materials and skills and which correspond to traditional design and specifications so as to avoid inhibitions against their use. It is pointed out that the main drawback of traditional building materials is their low durability when exposed to the influences of adverse weather conditions and general wear, and it is suggested that attention be given to improved products or building methods which may improve the durability of the structures and particularly of the walls and the roof.

30. The products envisaged lend themselves well to small to medium scale manufacture and the paper proceeds with a detailed summary of the characteristics of a manufacture established in accordance with the strategy it advocates. Salient features of such a manufacture comprise the appropriateness of the product in terms of cost, durability and acceptability, the simplicity and labour-intensiveness of the technology, the use of local raw materials and fuel including agricultural and industrial wastes and the integration of the production plant into the local environment.

31. The paper ends by describing some of the most important socio-economic impacts of a policy favouring the establishment of decentralized small to medium scale industries. In addition to such effects as increased G.P., increased employment and foreign exchange savings which are also achieved by conventional industries, the policy is also expected to lead to an improvement of the living standards of the rural population in terms of such important factors as housing, employment and self-reliance.

32. In connexion with the presentation of this paper, the UNIDO representative made specific reference to the general industrialization policy as laid down in the IFA Declaration, which, *inter alia*, comprise the promotion of:

- (a) national
 - (i) appropriate industrialization policies;
 - (ii) intensive use of national resources and infrastructure and development and internal regional development.

- (iii) encouragement of small and medium scale and rural industry
- (iv) achievement of higher efficiency in import substitution.

(b) Subregional/regional

- (i) trade promotion among developing countries
- (ii) creation of consultative and co-ordinating machinery for technology acquisition
- (iii) transmission of relevant technology and technical/managerial skills, particularly to the less industrialized countries.

33. The discussions which were marked by fruitfulness and interest, focused mainly on the following points:

- (i) The experts noted that among the difficulties encountered in the production and distribution of building materials, special attention needs to be paid to the following:
 - small and widely-scattered markets
 - logistical problems
 - non-optimal use of production units
- (ii) The experts noted also that there had been no appreciable development of competitive small production units because the appropriate technology was hard to come by and political support was lacking as was small business promotion.
- (iii) They noted also that the materials currently produced by small industries did not always meet the socio-economic conditions of the traditional milieu and therefore risked being rejected.
- (iv) They noted further that the building materials industry was handicapped by the lack of a solid research base and that this had its effects on product quality.
- (v) They went on to maintain that most countries lacked a sustained and directed financial policy in this sector and that had continued to paralyze the development of competitive small production units.

34. The discussions ended with the following conclusions:

- (i) That the production of building materials should be decentralized through the setting up of competitive small production units.
- (ii) That a policy should be adopted for technologies that favour small business promotion.
- (iii) That the production of building materials should be adapted to the socio-economic conditions of the population.

- (iv) That research on building materials should be promoted through the establishment of national and regional centres as a way of improving product quality and enhancing individual security.
- (v) That a special policy for financing the construction industry and technology on a specialized basis should be adopted.

D. Progress Report of the Programme for the Development of the Building Material and Construction Industries.

35. The meeting took cognisance of the 1977-1979 progress report of the programme for the development of the building material and construction industries presented by ECA and which may be summed up as follows:

36. The report provides a comprehensive review of activities undertaken during the preparatory assistance phase (Phase I) of the building materials and construction industries development programme covering the period August 1977-September 1979. In this phase, emphasis was placed on a rational inventory of resources of all kinds, including those available in the form of research findings which might be useful to the African region, and second on the establishment of those national, subregional and regional institutions which are vital in the implementation of practical projects identified on the basis of an analysis of the needs of African countries with special attention being paid to the least advanced and land-locked countries. The development or strengthening of national, subregional and regional policies and strategies and the identification of priority areas, technical, financial and other facilities which might help in programme implementation was also given prominence in this phase.

37. To fulfil the above aims, the ECA sent out three field missions (August-September 1977; December 1978-January 1979; May-July 1979) to 16 countries, representing various subregions in Africa, organized a meeting of African experts on building materials (July 1979) and, prepared and distributed to all African governments a comprehensive questionnaire which sought to assist them to make a preliminary assessment of the building materials and construction sector and identify areas requiring further attention. The report of the first mission of ECA experts received high commendation of the fourth conference of the African Ministers of Industry held at Kaduna, Nigeria in November 1977. The recommendations of the 1979 experts meeting were submitted to the Intergovernmental Regional Committee on Human Settlements at its first session, held at Addis Ababa in October 1979. The committee expressed its full satisfaction with the work done up to that time under the ECA programme. Response to the ECA questionnaire has so far been very favourable.

38. ECA has also made a substantial effort, according to the paper, to associate other organizations (in particular those in the United Nations System) in the work of the programme. Special mention is made of the United Nations Industrial Development Organization (UNIDO), the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), the United Nations Centre for Human Settlements (Habitat) and the United Nations Educational, Scientific and Cultural Organization (UNESCO). Such liaison is to be extended to other organizations and regional and subregional

groups. The paper ends with a discussion on some areas where further actions is required based on the experiences of the field missions, to help the current meeting in the consideration of the scope and urgency of future tasks.

39. The report evoked a very lively and interesting discussion and further information was provided by the ECA secretariat against the queries raised by the participants on specific points of the document. There was great unanimous appreciation of the excellence of the ECA work and its comprehensive coverage of all important aspects of development of the building materials and construction sector. The participants felt that the work represented a positive contribution and provided a good basis for further activities for the period 1979-81. It was also their view that ECA should assist member-governments by providing them with suitable guidelines on project implementation at national level.

B. 1979-1981 work programme for implementing the Building Material and Construction Industries Development Programme

40. The ECA secretariat presented a document on this agenda item:

41. The document E/CN.14/HUS/35 presented by ECA secretariat, is in the nature of a blue-print of the actions required to be undertaken in the African region in terms of each major component of (a) the development of building materials industry, and (b) the development of construction services industry, in one integrated framework. The importance of the document lies in its detailed and comprehensive identification of the specificities of the constraints which have hitherto been inhibiting the growth of this important subsector which has its own positive influence on several national and regional economic programmes and more importantly in its outlining a package of short-term and long-term solutions to these problems. According to the document, the suggested solutions are ECA-sponsored and UEDP-assisted back-stopping, primarily within the sphere of country initiative and responsibilities and secondarily, a joint effort of selected and concrete actions which can have a national as well as subregional and regional orientation as may be necessitated by conditions. The necessity for such an integrated blue-print of action-programmes has arisen from the deliberations, the decisions and resolutions of the Conference of the African Ministers of Industry, the Follow-up Committee on Industrialization in Africa (which is also of ministerial status and importance) and the Intergovernmental Regional Committee on Human Settlements and the specific designation of high priority to the development of this subsector, resulting finally in the setting up of a group of experts within the ECA Housing, Construction and Physical Planning Section and the drawing up of a detailed developmental strategy and plan by this Group for the consideration of the African Governments. Encouraged by the response of the latter, the programme was launched in August 1977 by the ECA, after detailed studies, through expert missions to several countries and evaluation thereof and further recommendations thereon by a meeting of African experts on building materials held in July 1978. The latter helped focus further attention on the tasks ahead for the benefit of African Governments and following this joint effort and further country missions mounted by ECA Group of experts, the following attention areas were identified:

- (a) Development and rationalization of the factors of production with emphasis on local resources and systems.
- (b) Development, modernization and standardization of the production base for building materials including distribution infrastructure.
- (c) Development and promotion of indigenous construction systems and services infrastructure geared to local resources, needs and conditions including planning and operational staff and manpower.
- (d) Purposive harmonization between the planning and implementation segments of national policies and execution essentially to forge a link of cohesion and synchronization with the other national segments of economic programming and execution which are vitally dependent upon the existence of a healthy and vibrant indigenous building materials and construction industry for their own efficiency and success.
- (e) establishment of a basic, effective and modern African service for information, research and technology, skills and manpower infrastructure, finance and institutional promotion of the development and utilization of this sector.

42. In evidence of its importance, the ECA has also set apart a sum of US\$200,000 for this work, out of a UNDP grant of US\$10 million allocated for inter-country African programme for 1970-81, in order to cover the preparatory assistance phase (October 1970-September 1970) and the full scale project phase (October 1970-December 1981). The preparatory phase document has also been submitted to all African Governments and elicited very favourable response. The next phase of actions forms the set of proposals placed before the Committee of African Experts currently in session. These proposals are the result of very intensive studies and consultations with some African Governments, and represent the minimum framework of action required at national, subregional and regional levels which will not brook delay if the objective of self-reliance in this field, by the year 2000 is to be achieved. Fifteen member States of ECA have already signified their desire to be closely associated with the implementation of this programme in anticipation of ECA services in this task through its group of experts and its associated assistance from HULFOCs, CAU, UNICE, Habitat, UNEP, UNECO and IIC.

43. The document outlines the output in the form of a work programme for the formative phase of 1970-81, with the following as the critical elements (which have their further respective sub-elements with a specific time table).

- (a) Rationalization and management of the factors of production;
- (b) Development and modernization of building materials production;
- (c) Development of construction systems and services;
- (d) Harmonization of the planning and the executing sectors;
- (e) Other support services.

The individual projects identified for promotion under each of the above 5 heads have a national or subregional or regional character based on operational necessity and feasibility, and country interests. The projects represent a fair cross section of the requirements of the countries of the

various subregions and the practical possibilities in the first phase, covering the period October 1979 to December 1981 and involving a budget of US\$62,700 (1979 October-December), US\$322,900 (1980) and US\$221,400 (1981) towards the cost of the experts' services, meetings and training programmes and establishment expenses. The scheme identifies the input responsibilities of African Governments, in particular, the temporary secondment of African experts from respective Governments to ECA enriching its expertise and introducing the required elements of participation and sharing of experience. UNIDO, ECA, OAU, and other agencies of the UN system (like UNFP, UNCTAD, ILO, UNESCO).

44. ECA presents this comprehensive plan to the African Governments through the meeting of the African Experts in earnest expectation of concrete guidance and advice on the appropriateness and adequacy of the proposed plan and further suggestions on how to improve or otherwise modify the plan in the interests of the objective of achieving self reliance by the year 2000 and complying with the mandate of the African Council of Ministers.

45. The ensuing discussions focused primarily on the following

- (i) The experts found that the activities described did not cover all the areas of concern of the African countries in the sector. In view of this, emphasis was laid on
 - The diversification of building materials to be produced (the stress on use of cement was considered excessive as compared to other materials).
 - Expanded training of technicians other than entrepreneurs.
 - Extension of the proposed training courses for the Central and Western Subregions to other subregions.
 - Formulation of standard specifications (for product quality control and use) and codes of practice and specification manuals. In this connexion, the group of experts agreed that the findings of the UNCTAD Seminar on Building Codes and Regulations for Developing Countries to be held in 1980 would make a significant contribution.
- (ii) It was noted that co-ordination at both the national and regional levels was absolutely vital to the attainment of the objectives of the programme.

The need to set up some mechanism in this area was stressed with urgency.

Furthermore, the experts emphasized the need to reinforce the systems for exchanging information among the countries themselves on the one hand and between these countries and ECA on the other hand.

- (iii) With regard to the objectives, the experts felt that it would be necessary to clarify in the proposal that the implementation of the programme was the primary responsibility of member States

and that the role of FCA and other organizations was to provide assistance needed to support the efforts of member Governments.

- (iv) The experts noted that there was a considerable imbalance between the activities intended to be carried out under the programme and the funds indicated in the document. This is why the experts felt that although the proposed activities were in line with the set goals they needed to be reviewed realistically so as to ensure a better equilibrium between financial resources and activities.

46. The experts considered the document satisfactory but felt that the resources for carrying out the programme seemed inadequate. In this regard the experts expressed their satisfaction with the work done so far by FCA in collaboration with other organizations. They also expressed the desire that the various activities should be undertaken with all dispatch since it was recognized that this programme is of great importance to all African countries for their economic and social development.

III. RECOMMENDATIONS

A. Raw materials development

Considering that geological exploration, appraisal and exploitation of raw materials are essential for the development of the building materials and construction industries,

Considering also that the techniques and methods currently used in African countries seem to be quite expensive and demand much time in order to yield concrete results,

Conscious of the need to ensure that programmes relating to the extraction of raw materials, their transformation into building materials and their use in construction are integrated as far as possible with the need to preserve eco-systems and the built environment

The experts recommend to African governments that

(i) New and efficient scientific techniques be introduced, for the location, extraction and utilization of raw materials and for the disposal of overburden, residue and waste matter in plant and construction sites;

(ii) A specific national policy and programme be formulated to ensure the redevelopment of worked sites

(iii) The amount of timber available for construction be used rationally the use of wood as a source of energy should be cut down as much as possible by the development of alternative sources of energy such as peat and solar energy. At the same time, adequate reforestation programmes should also receive attention.

Furthermore, the experts recommend that

(iv) the United Nations Environment Programme should formulate appropriate guidelines for African governments to follow regarding environmental protection in general and the extraction and utilization of raw materials in particular;

(v) the UNCS should assist governments in the national execution of construction works with a view to attaining optimum utilization of building materials;

(vi) UNIDO should promote the environmentally sound utilization of raw materials in the manufacture of building materials.

B. Production of building materials

Considering that the duality of the pattern of demand for building materials, for the urban and rural sectors will continue, thus requiring different types of building materials and construction services,

Taking into account the need for reducing the present dependence on expensive imported materials, services and technologies which, generally are not suitable for African social and economic situations or to indigenization.

Considering the bottle-neck of inadequate internal transportation facilities which tend to make building materials costly and scarce,

The meeting of the African experts on building materials and construction industries recommends:

(i) Formulation and implementation of special policies and programmes and creation of infrastructure facilities by African Governments to encourage entrepreneurship and decentralized production of building materials through a network of small- and medium-scale units suitably located near raw materials and local markets which would help to reduce the cost of production, environmental pollution and supply bottle-necks.

(ii) Introduction and promotion of new technologies, quality standardization of products, product popularization and financial back-up so as to overcome the present handicaps faced by the small-scale sector and to assist in economic viability of the production and through these measures, consumer acceptance.

(iii) Formulation of supporting schemes relating to supply and distribution to assist the units in efficient marketing of their products.

(iv) Promotion and popularization of production technologies and construction codes which respect social and economic conditions and which take into account the scope for utilization of local resources of materials, services, manpower and traditional techniques.

(v) Special attention to achieving an increase in production of cement as well as clay-based, lime-based, bitumen-based, agricultural wastes based products and binders through the above-mentioned kinds of modern and efficient small size units to effectively supplement the production from large scale units.

(vi) Development and promotion of large sized manufacturing units for cement, building bricks, timber and metal products, etc. wherever technically and economically feasible and the size of the market justifies this.

(vii) Integrated development of raw materials required for (v) and (vi) above.

C. Construction, research, consultancy and development services

Recognizing the need for well-trained and qualified manpower of all categories - engineers, architects, contractors, technicians, craftsmen, etc. - to minimize bottle-necks in building materials and construction sector, especially in relation to the design and construction of human settlements that reflect local African social and cultural practices.

Convinced that a sound base of research and information services is of primordial importance to the development and improvement of local building

materials, and the development and adaptation of building materials production and construction technologies in consonance with social and economic conditions in Africa,

Convinced that the sharing of existing facilities for training and research by countries in various subregions and in the African regions as a whole is in the spirit of effective integration of the continent and will contribute significantly to the achievement of the objectives of the building materials and construction industries development programme,

Noting that the present high cost of houses built in urban areas is unaffordable to the majority of the population and that the non-tenure of housing in the rural areas is a matter requiring urgent attention,

Aware of the lack of organized information on national, subregional and regional basis on African experts in various fields in the building materials and construction sector, and noting that the scarcity of finance to promote the setting up of competitive manufacturing units to produce local building materials and the construction of houses and buildings in such materials is a major constraint to the efforts being made by African governments to reduce their dependence on imported building materials and construction technologies and achieve greater self-sufficiency in this sector.

The meeting of African experts on building materials and construction industries recommends:

(i) Review by each African government of the validity of their existing building laws and regulations and of the codes of design and construction and their reformulation to suit the changing social and economic conditions in the respective countries and their codifications into manuals.

(ii) Preparation of detailed documentation on the short- and long-term requirements of each of the major categories of constructions planned to facilitate complementary actions in terms of production of building materials and development of the construction industry in general.

(iii) Creation and strengthening of existing facilities for the systematic development of a national cadre of construction personnel and specialists of all categories and levels, including the re-orientation of the syllabus of technical education, training and upgrading training programmes and a healthy synthesis between the architectural and design discipline and the engineering discipline of the profession in the interest of a well co-ordinated construction service.

(iv) Establishment of a centre in each country, if it does not already exist, for imparting professional training to construction personnel with effective co-ordination and integration on subregional basis eventually to lead to a regional basis thus facilitating maximum exchange of information and technology. In the meantime, inter-country co-operation programmes for the sharing of already existing facilities and experience should be encouraged.

(v) Detailed research studies on the effect of building materials and the design of construction on the health of the occupants and formulation of

alternative and suitable designs of construction based on appropriate building materials as guidelines to construction agencies and building technicians.

(vi) Research on, and development of techniques for reduction of construction costs in terms of both materials and construction technologies, including supply and distribution facilities; technological upgradation of rural dwellings; upgrading of low-income urban housing and development of low income housing plans; development of new types of medium-cost urban construction - intermediate between the present high-cost, sophisticated urban dwellings and the functionally bare rural dwellings which have to be improved in order to cater to the needs of the growing low and middle income group of the city population.

(vii) Establishment of national centres where these do not already exist for material evaluation and testing, standardization and quality control and formulation of standard specifications and codes of practice and making their compliance mandatory.

(viii) Establishment of national research centres where they do not already exist - for undertaking basic and applied technological research in terms of raw material investigation and evaluation, laboratory and pilot plant trials for determining their utilization potential, beneficiation of inferior grades of materials, development of substitutes, formulation of specification for quality standardization, providing technological data bank and information service, etc.; interconnection with their counterpart systems in neighbouring countries through the establishment of a subregional research centre.

(ix) Compilation and publication of a national dossier (to be periodically updated) to provide information on

- (a) Producers of major raw materials required for production of building materials;
- (b) Producers of building materials;
- (c) Construction companies, architects and engineers (also if possible on other categories of construction personnel);
- (d) Specifications on building materials;
- (e) Building technologies.

(x) Compilation of a dossier (to be periodically updated) of national scientists and technologists identifying their expertise and specialisation in terms of:

- (a) Geological surveys and mining;
- (b) Material investigation and research;
- (c) Production of specific building materials and production research.

(d) Production of equipment required for the manufacture of building materials.

(xi) Creation of a special fund and a building and housing finance corporation at the national level with separate and adequate budget and a clear mandate for assisting, in particular national entrepreneurs, establishment of competitive small and medium scale industrial units, promoting utilization of locally available materials and substitutes and construction services, and the building of low-cost dwellings without sacrifice of quality and functional necessities.

(xii) Positive policy and programme support by African governments by way of state promotion and popularisation of nationally desirable production of building materials and dwelling systems, user-interest and social acceptance of these materials and systems, engagement and encouragement of local entrepreneurs for production of building materials and construction services, organizing pilot and demonstration plants of production, exhibition of products and services and audio-visual publicity of building materials and construction systems.

D. Programme promotion and implementation

Convinced that the success of the building materials and construction industries development programme depends, inter alia, on the nature and effectiveness of the machinery for implementation and recognizing that a regrettable feature in most African countries is the fragmentation and dispersal of initiative and action responsibilities among several ministries and agencies, resulting in some distortions in co-ordinated planning and implementation of programme in the building sector and convinced that sound and effective channels of information exchange between African countries on one hand, and ECA on the other, information exchange and co-operation in the development, production and marketing of building materials among African countries are essential for the efficient development of the building materials and construction sector in Africa as a whole.

The Meeting of African Experts on the building materials and construction industries makes the following special recommendations for the attention of African governments:

(i) At national level

A high level nodal mechanism should be speedily set-up, if this has not already been done, within the ministry most concerned with inter-agency co-ordination within each African government and be armed with the required authority, powers and well-defined responsibility for the development of the building materials and construction industries and, in particular, for the following tasks:

- Consolidation of information on building materials, construction industry, infrastructure, research and related aspects of the sector.
- co-ordination of the short and long-term plans for the individual elements of the building materials and construction industry development programme and its inputs.

- Demarcation of priorities and related economic activities and back-up.
- Organizing the formulation of specific projects and fund support.
- Demarcation of agency responsibilities for actions and sub-actions and issuing directives for implementation.
- Undertaking watchdog responsibilities in monitoring the progress of actions and troubleshooting bottle-necks.
- Close interaction with ECA, UN agencies and others concerned in the countries of the subregion.
- Functioning generally as a centralized co-ordinating and communication centre on all technical matters involving ECA and through it, Governments and international organizations.

(ii) At subregional level

A Building Materials and Construction Industry Development and Consultative Council should be set up with the assistance of ECA, comprising representatives of the national nodal mechanisms referred to in (i) above and ECA. It should function as a special task force to periodically review the progress of actions initiated at national level and ECA level, identify and overcome the bottle-necks and formulate the further action-points necessitating attention and provide required technical and logistic support for implementation. The Council should be empowered to co-opt representatives of African financial institutions, research and technical centres, agencies issuing standards and codes, production-units and construction service agencies. It should meet at least once in every three months. ECA should provide secretariat service for this mechanism.

(iii) At regional level

ECA should function as the nodal point of intra-African consultation and co-ordination relating to the Building Materials and Construction Industries Development Programme. To this end, ECA should follow-up and assist the African Governments in determining their areas of developmental interest and priority in terms of the broad framework of actions outlined in the ECA Questionnaire.

E . Special recommendation

Mobilization of Resources for the Implementation of the Building Materials and Construction Industries Development Programme

The Meeting of African Experts on Building Materials and Construction Industries,

Taking note with satisfaction and approval of the progress report submitted by the ECA secretariat on the implementation of the preparatory phase of the Building Materials and Construction Industries Development Programme,

Noting that in resolution 8 (IV) adopted in Kaduna, Nigeria, in November 1977, the Conference of African Ministers of Industry laid special emphasis on the absolute priority that African Governments and the organizations concerned should accord to the implementation of the Building Materials and Construction Industries Development Programme in order to enable Africa to attain self-sufficiency in this sector as soon as possible,

Recalling also resolution 4 (I) adopted by the Intergovernmental Regional Committee on Human Settlements and resolution 358 (XIV) adopted by the ECA Conference of Ministers,

Emphasizing strongly the imperative need to give effect to the above resolutions as a matter of urgency.

Recognizing the need to mobilize resources in order to promote the implementation of the objectives of the Building Materials and Construction Industries Development Programme,

Noting further that the United Nations Development Programme requires that all countries should contribute to all regional projects submitted to it for financing,

Noting finally the interest that African Governments have shown in the Programme generally and, in particular, the desire of some of them to be closely associated with its implementation,

1. Urges all member States to integrate the Building Materials and Construction Industries Development Programme into their national development plans;
2. Approves the amended project description relating to the Building Materials and Construction Industries Development Programme for the period 1979-1981;
3. Extends its thanks to the United Nations Development Programme for its financial contribution to the implementation of the Programme, particularly, for having agreed to contribute US\$800,000 for the period 1979-1981;
4. Expressed the conviction that ECA, working together with other regional and international organizations, will continue its efforts to ensure that implementation of this Programme strengthens subregional and regional economic integration and facilitates the achievement of social advancement goals in the African region;
5. Also approves the amended work programme set out in the project description;
6. Undertakes to spare no effort to see to it that all countries, whether or not they are represented at this meeting, benefit fully from the facilities provided under the programme;
7. Authorizes the Executive Secretary of ECA to sign, on behalf of member Governments, the amended project description which will be submitted to the United Nations Development Programme in proper manner;

8. Urges the UN agencies, the World Bank, the African Development Bank and the Arab Bank for Economic Development in Africa and other multi-lateral and bilateral donor bodies to provide resources for the implementation of the Programme as a whole, particularly at the level of the various subregions.

IV. VOTE OF THANKS

Bearing in mind the sound organization of the meeting and more especially the high quality of the reports and documents made available to the participants, especially, those which deal with the present meeting, we, African experts on building materials and construction industries, meeting in Addis Ababa from 23 to 26 July 1979

- warmly congratulate the secretariat of FCA for the work it performed,
- request that the secretariat of FCA should continue along the same lines.

ANNEX I
LIST OF PARTICIPANTS

BURUNDI	Mr. Egoïde Ndahibeshe Directeur général du bâtiment Ministère des Travaux Publics, de l'Équipement et du Logement Bujumbura
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ANNEX II
LIST OF DOCUMENTS

A. ECA SECRETARIAT DOCUMENTS

Information documents

- | | |
|-------------------------------------|-----------------|
| 1. Provisional agenda | HUS/INF/5 |
| 2. Annotated provisional agenda | HUS/INF/5/Add.1 |
| 3. Draft programme of work | HUS/INF/6 |
| 4. List of documents | HUS/INF/7 |
| 5. Provisional list of participants | HUS/INF/8 |

Reference documents

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| 6. First report of the first team of experts on the construction industry and building materials industry development programme | ECA/CMI/FCIA.4/WP/5:
ECA/CMI.4/INF/WP/5:
E/CN.14/HUS/21 |
| 7. Construction and building materials industries in Africa | E/CN.14/HUS/22 |
| 8. Components of the policy and strategy for the development of construction and building materials industries | E/CN.14/HUS/23 |
| 9. Report of the meeting of African experts on building materials | E/CN.14/HUS/24 |
| 10. Building materials and construction industries development programme | E/CN.14/HUS/29 |

Ad-hoc documents

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| 11. Progress report on the programme for the development of the building materials and construction industries | F/CN.14/HUS/34 |
| 12. United Nations Development Programme Project of the Governments of the Africa region. Project description | E/CN.14/HUS/35 |

B. UNEP DOCUMENT

- | | |
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| 13. Environmental concerns in the building materials and the building construction sectors | |
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C. UNCHS DOCUMENT

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| 14. The role of the United Nations Centre for Human Settlements (Habitat) in the field of building materials, construction industry and technology | |
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D. UNIDO DOCUMENTS

15. The role of small- and medium-scale building materials industries in the economic and social development UNIDO/10D.275

E. COUNTRY PAPERS

16. Ghana: Development of building materials industries in Ghana by A. A. Hammond
17. Kenya: Building materials and construction industries development programme by P. E. Kanyue
18. Morocco: -Le Secteur des matériaux de construction au Maroc by Driss Eouazzaoui
19. -Catalogue des normes marocaines. Service de normalisation industrielle marocaine (S.N.I.M.A.) Direction de l'Industrie, Rabat

ANNEX III
AGENDA

1. Welcome and opening addresses
2. Election of officers
3. Adoption of the agenda and organization of work
4. Environmental impact of building materials production and construction activities
5. Role of the United Nations Centre for Human Settlements in the field of building materials and construction industry and technology in developing regions
6. Role of small- and medium-scale building materials industries in the economic and social development
7. Progress report on the implementation of the Building Materials and Construction Industries Development Programme
8. Work Plan 1979-1981 for the implementation of the Building Materials and Construction Industries Development Programme
9. Consideration of draft conclusions and recommendations
10. Other matters
11. Adoption of the draft final report of the meeting

ANNEX IV
PROGRAMME OF WORK

Monday, 23 July 1979

0800 - 1000	Registration of participants
1000 - 1100	Opening of the meeting
1100 - 1130	Break
1130 - 1230	(a) Election of officers (b) Adoption of the agenda and organization of work
1430 - 1600	Item 4: Environmental impact of building materials production and construction activities
1600 - 1630	Break
1630 - 1800	Item 5: The role of United Nations Centre for Human Settlements in the field of building materials and construction industry and technology in developing regions

Tuesday, 24 July 1979

0900 - 1030	Item 6: The role of small- and medium-scale building materials industries in the economic and social development
1030 - 1100	Break
1100 - 1230	Item 7: Progress report on the implementation of the Building Materials and Construction Industries Development Programme in Africa
1430 - 1600	Item 7: Continued
1600 - 1630	Break
1630 - 1800	Item 7: Continued

Wednesday, 25 July 1979

0900 - 1030	Item 8: Work Plan 1979-1981 for the implementation of the Building Materials and Construction Industries Development Programme in Africa
1030 - 1100	Break
1100 - 1430	Item 8: Continued
1500 - 1800	Film presentation

Thursday, 26 July 1979

1600 - 2100	Item 9: Consideration of conclusions and recommendations Item 11: Adoption of the draft final report of the meeting Closing session
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