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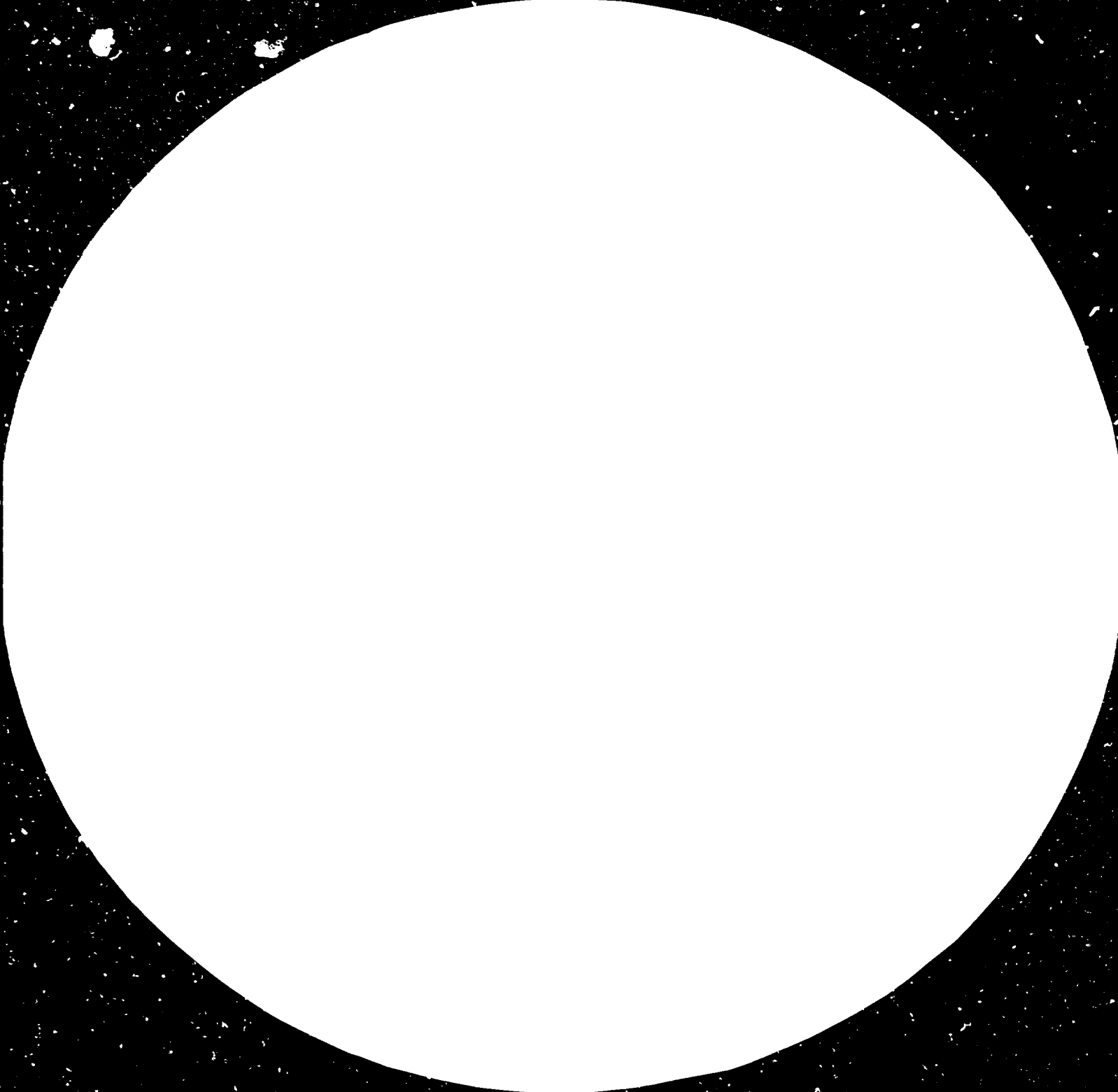
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SECTORAL SURVEY PAPER OF THE  
BUILDING MATERIALS AND CONSTRUCTION INDUSTRY\*

(Revision I)

Prepared by

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in co-operation with  
Negotiations Branch

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REVISED DRAFT AFTER CONSULTATIONS WITH UNCHS, NAIROBI

I. INTRODUCTION

The Third General Conference of UNIDO in the New Delhi Declaration and Plan of Action decided that the System of Consultations should be established on a permanent basis as a continuing and important activity of UNIDO (ID/Conf.4/22, Chap. VI). It was stressed that the System of Consultations should be strengthened in view of the implementation and related objectives of the Lima Declaration and Plan of Action.

In expanding the scope of the System of Consultations the Third General Conference of UNIDO recommended that the System should cover all major sectors of industry. The proposal was made that additional 2 sectors each should be included for 1982-1983 and for 1984-1985 biennia. The areas should be selected from building materials and construction industries, non-ferrous metals and electronics (ID/B/257). The building materials industry complements the construction industry by providing a balance in building programmes in developing countries. Without this balance the industrialization in these sectors will progress at a much slower pace and would not contribute effectively to the development of the build environment.

To demonstrate the importance of this sector of industry, the aspects and future prospects in developing countries for the building materials and construction industry will involve 10 per cent of the World's working population. Further, more than 50 per cent of the gross fixed capital formation estimated at US\$ 19 billion was accumulated in 1975. In considering the prevailing price levels and labour rates, it can be assumed that the building materials and construction industry represents more than 50 per cent of the total investment and that US\$ 2.5 billion in foreign currency is spent yearly in African countries to import the necessary building materials. The industry is an essential industry in any economy and plays an important role in economic development. New building and construction usually accounts for from 4 to 8 per cent of GDP. Every developing country therefore has to

important stake in the development of an efficient domestic building materials and construction industry. The appropriate range of building activities that should be undertaken by the domestic industry in a particular country at any given stage in its economic development will depend on factors such as the volume and continuity of demand for different types of buildings and on the availability of the requisite human and other resources. It is clear that the encouragement of an appropriately dimensioned and efficient building materials and construction industry should be a priority objective of both national policy and international assistance. It is therefore that the System of Consultations will aid to assist the building materials and construction industry in the Third World to assess this industry in the light of its importance, priorities and impression of regional preferences which will be made subject of Consultation Meetings in the proposed biennium 1984-1985.

## II. SUMMARY

The System of Consultations laid down in ID/B/258, including its principles, objectives and characteristics, which was approved by the Permanent Committee during its Sixteenth Session held in Vienna from 16-20 November 1981, calls for studies by UNIDO to substantiate the importance of holding consultations in different sectors of industry, (ID/B/258, page 5, para. 21). In this context, the sector of building materials and construction industry, upon approval by the Industrial Development Board at its Seventeenth Session in April 1982, will hold its Consultation Meetings in 1984-1985 biennium.

To support the members of the Industrial Development Board in their discussions at the forthcoming Seventeenth Session objectively, UNIDO prepared a sectoral survey paper on the basis of the terms of reference attached under Annex I. The terms of reference took into consideration the report by the UNIDO Secretariat ID/B/C.3/110, co-ordination of activities with other United Nations bodies and organizations in the field of mutual interest (ref. page 7, para. 20 and page 10, para. 40).

The present sectoral situation in the building materials and construction industry

There is a growing pre-occupation with the application of technologies to match the economic objectives and conditions in the developing countries. These are apparent incongruities between under-utilized local resources and alien Western industries.

As previously indicated, the construction industry and the building materials industry are so closely inter-linked that one cannot describe the first without considering the second. There are, obviously, considerable differences between countries and even within individual countries. In general the situation can be summarized as follows:

Approximately two thirds of the total global construction industry falls in the areas of basic infrastructure, i.e. industrial and institutional building as well as construction of roads, dams, bridges, etc. The remaining one third accounts for housing construction. This is reflected by the fact that in 1976 the World Bank disbursed US\$ 753 million for construction out of a total of US\$ 2535 million disbursed. The technologies used in the construction industry are determined by conditions in any environment, the economic and social objectives, its structure and organization, and the availability and quantity of production resources.

Conveniently, the type of housing, for instance, can in most developing countries be divided into the permanent conventional urban-type houses built by the formal construction industry at high cost and the non-durable traditional sub-standard structure mainly used in urban and urban-fringe areas and constructed at low cost by self-help methods. It is a well-known fact that in many developing countries the construction industry uses sophisticated construction techniques in the formal building sector, for the most part or totally based on imported building materials. The informal sector of the construction industry has received very little attention. Gradually production capacities have been developed in varying degrees to produce building materials indigenously. But this trend has had no impact on the informal sector. The strategies used by most developing countries for the building materials production has predominantly benefitted large-



scale government construction and private modern residential housing, in both cases reaching only the most affluent sector of the population. As a consequence the great majority of the population in the developing countries, living mainly in rural areas, has been generally deprived of the benefit of the development in the building materials and construction industry. This is mainly due to the excessive cost of the conventional materials as well as the incompatibility with traditional methods in the construction and living patterns. The following demonstrates the above mentioned situation on regional level: the East-Asian region, from Iran to Japan, Indonesia and the Islands of the Pacific, contains 55 per cent of the World's population but occupies only 17 per cent of the global land area. By the year 2000, the population of this region will be about 3.6 billion of which 1.4 billion will live in urban areas and 2.2 billion in rural areas.

The authorities of developing countries realize that whatever limited resources are available for the building materials and construction industry, the needs for development are definitely a pre-requisite for the economic development of a country. The further development of the capacity and efficiency of the building materials and construction industry to meet the increasing demands for human shelter, institutional building and industrial construction is of utmost importance. In considering policies for sectoral planning and employment creation in construction activities, it should be recognized the inter-relation and dependency with government policies and programmes to assure continuity of construction demand, and, thus, continuity and stability of working conditions and possibilities of improving the skills and efficiency of construction manpower resources.

The building materials and construction industry in developing countries is characterized by amorphous and unorganized holdings with low productivity, high building cost, shortage of skilled labour and shortage of essential building materials. Improvements through consultations are urgently needed both quantitatively as well as qualitatively.

Some of the main techno-economic problems in the sectoral survey area in the building materials and construction industry are:

- (a) Inefficiency of production capabilities;
- (b) Insufficiency of technical and managerial skills;
- (c) Unorganized and costly marketing;
- (d) Inadequate financing resources for construction activities;
- (e) Scarcity of fuel and electric power;
- (f) Insufficiency of infrastructure;
- (g) Inadequate planning and organization;
- (h) Dependency on imported raw materials and foreign contractors;
- (i) Shortage of capital and equipment.

The use of appropriate technology should be based on the following criteria:

- (a) The maximum use of local resources, both human and material, generating local control and initiatives;
- (b) Expanding the use of local resources and improving existing methods;
- (c) Decreasing reliance on foreign resources and inputs to increase self-sufficiency;
- (d) The incorporation of the informal sector into the formal sector to be encouraged with a view to having a base of skills that are initially easy to acquire;
- (e) Waste of resources to be minimized;
- (f) Dependency on a complex infrastructure for implementation to be avoided;
- (g) Sufficient flexibility to encompass as wide a sector of population as possible;
- (h) The capability to accept production fluctuations without disastrous economic results;
- (i) Stress to be laid on the use of local resources and labour employment-oriented building methods, low-energy technologies;
- (j) Be consistent with cultural and environmental interest of the community.

In addition the following technological developments could be considered:

- (k) Production of building materials using locally available materials, especially utilization of industrial and agricultural wastes to produce durable materials for the building materials and construction industry;
- (l) Better management in the building materials and construction industry through organization of this industry along modern acceptable industrial lines to effect economies through standardization and mass production and accelerate the pace of construction by gradually introducing industrialized building components: increasing the efficiency of the building materials and construction industry and productivity by application of modern management practices and improving the relationship between the design and production phases;
- (m) Training in the building trades, upgrading of techniques and institutional training programmes and new techniques, which become necessary;
- (n) Measures of transfer of technology to be adopted or developed, organized feedback of experience and evaluation of appropriate technologies;
- (o) Improved rationalization of building practices such as review of outmoded building by-laws, construction codes and building specifications;
- (p) Encouragement of the information exchange, research and development in the field of the building materials and construction industry.

The development of sub-regional and regional co-operation and joint demonstration projects will accelerate the development of the building materials and construction industry in the sub-regions and regions of common interest. The sub-regional, regional and international co-operation should be supported and encouraged by Consultation Meetings of UNIDO on the building materials and construction industry for regional and global co-operation between the industrialized and developing countries.

### III. FINDINGS

To substantiate the necessity of holding Consultation Meetings, there exist the following problematic constraints:

(i) Demand versus capacity

There is an inconsistency between the demand for construction and the potential production capacity of the domestic building industry as related to the population, whereby the added value of construction mainly measures the input of labour as a share of the Gross Domestic Product (GDP) in the developing countries. This share varies between 2.1 to 7.6 per cent of the GDP and between (in US\$) 1.0 - 40.0 of per capita value added for construction. Compared with Japan, which has a per capita added value of US\$ 181.5.<sup>1/</sup> The low figures can be explained as an underemployment of the domestic building materials and construction industry. Without long-term planning of the building materials and construction industry demand by the Government and without adequate statistical data to illustrate the present situation, the industry is unable to make proper analysis of the capacity problem and to take precautions for the future.

(ii) Influence of Government policies and administration

Various surveys of the recent years have indicated a number of problems in connection with the Governments' policies and public administration of the building materials and construction industry. As a larger percentage of all activities in the building materials and construction industry is being financed and/or managed by the Governments' agencies, it is evident that the "environmental factors", which govern the the development of the domestic building materials and construction industry are largely dependent upon the Governments' policies and administration of the industry.

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<sup>1/</sup> "World Tables 1976", World Bank, Washington

(iii) Problems of financing building programmes

A critical path to the success of building programmes in the countries of relevance passes through monetary policies, financial systems and their institutions. Although action has been taken by different countries to provide long-term loans to the public, it is desirable that further plans should be developed to increase the investment in the building materials and construction industry.

(iv) Aspects of protection policies, taxation and duties

The aspects are normally not based on realistic approaches of the governments and the building materials and construction industry is hindered by Government protection policies and the effect of taxation and duties stipulated.

(v) Problems of public procurement and contract methods

There is a practice in existence in the procurement procedures of some countries in the building materials and construction industry which has a negative effect on the domestic consultants on contractors. This can be seen in the Government's system of yearly budget allocation which indicate prohibition of contracting on multi years projects in the building industry. Another can be found in the different systems of prequalifications and selection of contractors as practiced in various agencies in charge which is detrimental to investments in the building materials and construction industry. The procurement is, in some instances, problematic by differences in contractual conditions as stipulated by foreign investors and/or consultants, in accordance with the standards prevailing in their home country. Standards and conditions are also different from one developing country to another.

(vi) Financial support to domestic entrepreneurs

There are problems for the domestic building materials and construction industry caused by the high interests on loans and loans on working capital from domestic financial institutions

to domestic entrepreneurs. It might be said that the policies of domestic banking institutions are in many cases indicated by risk interest on loans above the normal industrial interest on investment loans which add to the cost of loan acquisition for the domestic entrepreneur. It is also desirable to improve financing for small-scale entrepreneurs both for working and investment capital.

(vii) Problems in building legislation, codes and standards

The building laws, regulations and codes are different for various countries and regions. They partly or totally originate from former colonial times and when available and updated then they are influenced by all kinds of technologies and standards imported from various countries such that within the domestic building material and construction industry they vary from one building material producer to another. It is therefore, in many cases, nearly impossible to meet material demands for mass building developments, since the capacities of the production of selected standard materials are not continuous in flow to support building schedules to be met and thus cause escalation of costs in all phases of the industry. These conditions have effected the quality of the building materials and construction industry. Without the necessary controlling operations this situation might cause serious problems and implications on public safety.

(viii) Problems in enforcing standards and quality control

In addition to the problems mentioned under (vii), it is recognized that there is a lack of understanding of the importance of quality standards among producers, clients and local building authorities with regard to both economic and safety aspects. Information and education in this field will be of utmost importance. also of great significance are the recognized shortages of testing facilities at the country or regional level and the insufficient awareness by governments of the need to support newly created institutions with the necessary funds.

(ix) Deficiencies in planning and planning data

It is evident that there are deficiencies in statistical data on the building industry, and that the further identification of such data is necessary. The need is only recognized in general terms without assessment of the scope and magnitude for such data. This implies that lack of figures on present and future demand and supply in the building materials and construction industry restricts the necessary planning and programming by the governments as well as within the industry.

(x) Technical constraints

Apart from the political, financial, legal and other "environmental" factors there are a series of technical constraints which restricts rational and efficient production in the building materials and construction industry. It will be necessary to improve these sectors by solving technical shortcomings in this industry, the construction contractors and consultants respectively, as well as with major overall problems of co-ordination, planning and management of the production.

(xi) Manpower problems

It is recognized that the governments in developing countries are showing more and more interest in the development of the building materials and construction industry. This trend is based on the recognition of the importance of increasing employment opportunities in the industry which is an important factor in the industrialization process of developing countries. This means, that the capabilities and efficiency of the domestic building materials and construction industry are to be improved and further developed for the increase of standard of living and self-sufficiency in the industry. It is also recognized that major short-, medium- and long-term planning in the building materials and construction industry are the tools for gradual improvement in the industrialization of a country. In other words, to accomplish the above-mentioned targets and goals, continuous

efforts have to be made in research and development both locally and for sub-regional, regional and possibly global employment-oriented technologies with the purpose of finding possibilities for job creation at reasonable cost, without hampering a competitive performance by the industry. Since normally the private industry, with exception of certain cases, has no motivation for making such efforts, and cannot be expected to invest time and money in such research work, these activities should be organized by the governments. However, manpower problems comprise a serious shortage of skilled labour in all fields of the building materials and construction industry and will have to be accommodated by further development of ongoing vocational training programmes, as well as planning of curricula in accordance with the needs in individual countries and formulation of performance standards of skilled workers. It will be necessary to improve and initiate planning of training institutes and facilities.

(xii) Educational bottlenecks

There is a recognized general shortage of properly educated and well-trained manpower at all levels of the building materials and construction industry, which is a serious constraint for the development of an efficient industrial formation. The shortage is particularly serious at the technician and skilled worker level and in most of the countries the existing training capacity is insufficient. There is also a general need for better "performance discipline" at the various staff levels and sense of responsibility of both public and private services. This might partly be a result of inadequate salaries, enumeration and incentives. Further in the public services the personnel turnover is due to different levels of remuneration between the public and private industry. It is of utmost importance that motivation of technicians is supported by incentives in order to guarantee the technician personal development. For the developing countries to increase their building materials and construction industry the



engineering and professional staff will have to develop organizational and managerial skills. People with poor education and training can never become first class building contractors and managers. A diversified industry capable of carrying out a wide range of work, can not develop unless the qualifications of the industry and their staff can be improved.

#### IV. RECOMMENDATIONS

In view of the mandate to include building materials and construction industry in the programme of consultations of UNIDO for 1984-1985, the sectoral survey paper on the status and problems of the building materials and construction industry as a preparatory activity implemented in 1981, identified in its findings the main problems facing the building materials and construction industry.

Upon approval by the Industrial Development Board (IDB) of UNIDO, the activities for the preparation of the First Consultation Meeting will be convened during the second half of 1982, with a working group meeting of selected experts in order to revise the sectoral survey paper and propose relevant issues to be included in the work programme for the preparation of the First Consultation Meeting.

In order to facilitate the selection of relevant issues by the experts of such a working group, the following aspects and focal points should be considered:

- the development of the building materials and construction industry in the developing countries has an important social dimension or redistributive implication and should be given priority in accordance with the following objectives:
- to evaluate the production technologies to encourage the production of building and construction materials, which are durable and inexpensive and can be produced locally using locally available raw materials and skills;

- to meet the basic needs of the great majority of the population of developing countries not only to make available the same kind of input traditionally used by the low-income groups of the population but also by modifying the applied production processes to better respond to durable, functional and structural use in the construction industry;
- to define programmes for the developing countries for exploration and listing of their resources in terms of local raw materials and local energy resources in order to produce indigenous building materials with the lowest energy inputs; these programmes can be carried out regionally, sub-regionally to possibly define, if appropriate, and implement those defined programmes;
- to strengthen and spread the facilities for a gradual broader know-how of the resources aimed at efficient, rational and planned use of the available potentialities as well as to draw up and apply special measures for increasing renewable resources, taking into account the need to maintain an environmental balance;
- to integrate the building materials and construction industry with the agricultural and agro-industries sectors whose development is particularly predetermined through the development of their by-products;
- to strengthen the production of the building materials and construction industry in developing countries to substitute the import of materials used in this industry and the preparation of programmes which can be expected to have the impact of becoming self-sufficient in the demand of building materials;
- to promote new industries to be drawn up and should as a matter of priority be stressed on the use of basic raw materials for the production of building materials; such

as: burnt bricks, stabilized earth, lime, building stone which are easy to produce in small-or medium capacities in accordance with their needs in the national plans for economic and social development:

- to develop the training of nationals for the building materials and construction industry and improve with those programmes existing situations for national entrepreneurs, technicians, medium-level technicians and labourers, managerial and institutional personnel:
- to promote, strengthen research in industry as a vital necessity for the development of the building materials and construction industry:
- to define and seek a system of documentation and information of acquiring and using results of research carried out in the industry on regional and global levels:
- to undertake programmes for progressive conversion by assessment of their present capacity of public works and building laboratories into national research institutes. Define, co-ordinate and implement R and D programmes focused on local resources and the use of appropriate technologies:
- to encourage on sub-regional level the concerted action for drawing up and application of codes, regulations, standards and other unified texts, taking into account the physical and sociological conditions.

ANNEX

TERMS OF REFERENCE

for the Preparation of a Sectoral Survey Paper on the  
Status and Problems of the Building Materials and  
Construction Industry

INTRODUCTION

In 1981, a "Monograph on Appropriate Industrial Technology for Construction and Building Materials" was published (UNIDO/ID/232/12) resulting from the International Forum on Appropriate Industrial Technology in 1978. The monograph covers a programme of action on the aspects and future prospects in the developing countries for the building materials and construction industrial development which involves 10% of the World's working population.

PURPOSE OF THE PROJECT

The purpose of this project is to prepare a sectoral survey paper on the status and problems of the building materials and construction industry at global and regional levels, placing emphasis on the situation in this sector of industry in selected different regions with the major variables influencing the development of this important industrial sector and to give future outlooks on the building materials and construction industry. The industry, hereby called "building industry", consists of two sectors: building materials and construction industries which cannot be separated. The building materials industry complements the construction industry by providing a balance in building programmes of the developing countries. Without this balance this sector of industrialization will progress at a much slower pace.

The results of the project are expected to give a clear assessment of the "building industry" in each region in the light of their importance priorities and expression of regional preferences which will be made subject of consultation meetings in the forthcoming period.

DUTIES OF THE CONSULTANTS

The consultants are required to develop a regional assessment and survey on the outline (Part A and B) and in collaboration with the UN Regional Commissions and other UN representing agencies as well as the World Bank. The outline components are not necessarily exhaustive and the consultants are requested to make additional assessments which they might feel essential to complement the sectoral survey. The consultants are also requested to take into account, as a basis for their work the Monograph on Appropriate Technology in order to ensure the comparability of the results. The submission of the consultants should be ready and available in February 1982.

O U T L I N E

Sectoral Survey Paper of the Building Material  
and Construction Industry ("building industry")

Part A

I. The building industry in the industrialization of developing countries, including least developed countries, land- and sea-locked countries in the region, should be examined along the following lines:

- the structure, role and importance of the building industry;
- the presence and role of TNC's in the region, their interest in building industry programmes, in the use of indigenous locally available materials for the industrial production of building materials and the basis of those materials, the use of appropriate construction technologies;
- their concern in the imports of materials and their interest in the local production of necessary materials for domestic and regional markets;
- which are the major important sub-sectors in the regions and producing countries of basic materials and equipment for the building industry?
- the limitations of technical decision-making and the need for classification and definition of the relationship of technological factors and their influence on economic and policy development.

II. The outlook by major sub-sectors

- production and consumption in the region with main indicative figures; the degree of processing developed in primary, secondary and auxiliary products;
- what is the current situation in the demand of building industry to ensure a balance of materials and manpower to support building programmes and future building demands?

- what are the problems?

technological;

identification of genuine low capital investment technologies;

the situation of transfer of technologies and rational use of local raw materials to produce building materials and construction equipment;

non-availability of complementary industries;

- restraint caused by auxiliary necessary inputs such as energy, infrastructure, transport, etc.
- what is the institutional infrastructure available for technological development, educational facilities for technology and manpower training and dependency on outside training?
- the status of R and D activities within the region;
- market and trade relations;
- the situation of investments, major development projects in realization;
- social implications and their effects on the building industry;
- projections of the building industry until the year 2000.

### III. The Future of the Building Industry in Various Regions

- what is likely to be a significant development in the different parts of the region by the year 2000 and further?
- how far are national authorities considering the building industry in terms of the demands of rural and urban development?
- what could be considered as integrated parts of rural development projects;
- what are the constraints to be considered for development, how do they differ in various parts of the region?
- what are the national/Government intentions in developing policies and strategies for the growth of the building industry?
- issues proposed for discussion for future consultations.

Part B

- the preparation of the scope for the possibility of future surveys in other regions and informative documents for further involvement in regional and global consultation meetings in the building industry;
- the possibility of joint consultations with other UN agencies, such as ILO and HABITAT, the World Bank and UN Regional Commissions;
- the execution of multi-national industries and non-industrial projects to be developed by consultations on the building industry in developing countries and contributions to bring about complementary co-operation and development among developing countries in the World.



References

1. Industrial Development Board  
ID/B/C.3/110, 16 October 1981  
Co-ordination of activities with HABITAT (page 7, 20)  
ECA and OAU (page 10 - 40), co-operation projects page 13.
2. Meeting of African Experts on Building Materials, July 1978  
(N. Biering)
  - a) Introduction, pages 3, 4, 5, 6, 7, 8 - 15, 19
  - b) UNIDO/TOD 175, 29 June 1979  
Role of small - medium scale B.M. on Economic and  
Local Development, 23-27, 1979  
  
Meeting of Experts in Addis Ababa:  
  
Introduction first para. page 3, page 4  
Present situation, page 5, para. 3, improve with  
World Bank assistance report  
  
Objectives: page 7, page 11 products  
Characteristics: pages 10, 11, 12, 13.  
The socio-economic impact: pages 13, 14, 15.
3. ECA - Report African Experts E/CN/14/HUS 24, 28 July 1978  
Introduction background no. 1 import figures 50% matrix  
No. 2/3 Constraints  
No. 4 Construction Industry  
No. 5 Objectives  
No. II Statement and Agreed Conclusions, pages 5 and 7
4. ECA - Expert Meeting, 18 June 1979, E/CN/14/HUS/35  
Important for use in report  
page 7, para. 6 - cement
5. ECA - Conference Document E/CN/14/HUS/29 15 September 1978
6. ECA - Progress Report Development building materials and construction  
industries, E/CN/14/HUS/34, 12 June 1979  
important statements
7. Ad Hoc Expert Group Meeting Construction Sector  
HS/Conf./2/84 18 November 1981
8. HABITAT Ad Hoc Expert Group Meeting  
HS/Conf./2/81/7 21 November 1981

9. HABITAT Ad Hoc Expert Meeting Development of Indigenous Construction Sector, HS/Conf./2/81/15, 7 October 1981  
Selection and use of appropriate building technologies  
General Conclusions and Recommendations
10. Guidelines for Informed Choice of Building Technology  
HS/Conf./2/81/20, 23-30 November 1981
11. Selection and use of Appropriate Building Technology  
HS/Conf./2/81/21, 23-30 November 1981  
Ref.No. 2. Traditional Know-How  
3. Evolution to Indigenous Technologies  
5. Use of Appropriate Technologies  
page 14. Conclusion and Recommendations
12. The Role of Building Research in Development of Indigenous Construction Sector - HS/Conf./2/84/24, 21 October 1981  
-  
I. Introduction  
III. Problems  
V. Role of Research Institutes
13. Financial and Non-Financial Assistance to Local Contractors  
HS/Conf./2/81/14, 9 October 1981
14. World Bank Report on the Construction Industry by Mr. John Burfield and Mr. A.C. Law
15. Technical Report No. 37, Development of Building Materials and Low Cost Housing in Indonesia, DP/ID/SER.A/149, May 1978
16. Directors' Meeting of UN - ECA (Economic Commission for Africa)  
30 April - 3 May 1980 conc. Building Materials Research Institutes, Country Papers.
17. Priority Areas of Further and New Building Research Activities in Africa  
E/CN.14/HUS/39, 24 April 1980

18. Experience of the ESCAP Region in the Promotion of Cooperative Efforts in Building and Building Materials Research, May 1980 by the ESCAP Secretariat (Economic and Social Commission for Asia and the Pacific)
19. Development Proposals for the Construction Industry, DP/ID/SER.A/149, May 1978
20. Industry 2000 - New Perspectives, background papers, volumes 1-4  
Vol.I Int.Financial Flows UNIDO/IOD 324, Dec.1979  
Vol.II Int.Ind.Enterprise Co-operation, UNIDO/IOD, Dec. 1979  
Vol.III Int.Flow of Technology, UNIDO/IOD 326, Dec.1979  
Vol.IV Int.Trade in Ind.Products
21. World Economic Survey, United Nations E/1981/42 ST/ESA/115
22. New Industrial Planning Techniques, HARCO, Sectoral and Project Linkages, A.Kuyvenhoven, Centre for Dev.Planning, Erasmus University, Rotterdam (The Netherlands), No.5, 1980
23. Role of Industry and Ind.Policies in the Third Dev. Decade, H.C. Bos, Erasmus University, Rotterdam (The Netherlands), No. 5, 1980
24. Cement for Developing Nations, The Prospects and Challenges, Rock Product Periodical, April 1981
25. Statistical Data of the Cement Production in the World
26. World Cement Market in Figures 1913-1977, National Review No.35, Cembureau, European Cement Association, Paris, France.
27. Development of the Indigenous Construction Sector:MC/CONF/2/81 Nairobi, 23 October 1984
28. Strategy, Policy and Issues for the Promotion of Indigenous Construction Industries in Developing Countries - revised report, 1981

Addition to References

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- UNCHS:
- Dr. A. Ramachandran, Executive Director, UNCHS
  - Mr. E. Winkowski, Interregional Adviser
  - Mr. B. Hyland, Officer-in-Charge of  
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  - Mr. M. Piche, Chief, Building and Infrastructure  
Section
  - Ms. A. Celik, Officer.
  - Mr. V. Krivosnejev, Officer
- ECA:
- Mr. George Kimani, Director, ECA/UNIDO Industry  
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  - Mr. Max Falade, Chief, Housing, Construction and  
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  - Mr. Apéti Danson, Co-ordinator, Building Materials  
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  - Mr. N.R. Srinivasan, Adviser (BMCIDP)
  - Mr. Joseph N. Okyere, Adviser (BMCIDP)

