



**TOGETHER**  
*for a sustainable future*

## OCCASION

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



**TOGETHER**  
*for a sustainable future*

## DISCLAIMER

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

## FAIR USE POLICY

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

## CONTACT

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

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



17165

Distr.  
LIMITED

ID/WG.479/4(SPEC.)  
15 November 1988

ENGLISH  
ORIGINAL: SPANISH

United Nations Industrial Development Organization

---

Regional Expert Group Meeting on Co-operation  
and Development in the Field of Building  
Materials Production\*

Guatemala City, Guatemala  
24-27 October 1988

REPORT\*\*

2/4

---

\* This meeting was organized by UNIDO together with the Permanent Secretariat of the General Treaty on Central American Economic Integration (SIECA).

\*\* This document is a translation of an unedited original.

CONTENTS

<u>Chapter</u>		<u>Paragraphs</u>	<u>Page</u>
I.	Conclusions and recommendations agreed	6-33	4
II.	Organization of the meeting	34-38	7
III.	Summary of the discussions	39-50	8
Annex I	List of participants		11
Annex II	List of documents prepared by the UNIDO Secretariat		14

## INTRODUCTION

1. The Regional Expert Group Meeting on Co-operation and Development in the Field of Building Materials Production was held in Guatemala City (Guatemala) from 24 to 27 October 1988. A total of 25 participants attended, 16 from five countries of the Central American region and nine from regional institutions (see annex I). This meeting was organized in co-ordination with the Permanent Secretariat of the General Treaty on Central American Economic Integration (SIECA).

2. At its fourth session, held on 29 July 1988, the UNIDO Industrial Development Board requested the Director-General to begin work on the preliminary preparations for the convening, during the biennium 1990-1991, of the Second Consultation on the Building Materials Industry.

3. As one of the measures in the process of preparing for the Second Consultation on the Building Materials Industry, UNIDO, in co-ordination with SIECA, arranged for the convening, from 24 to 27 October 1988 in Guatemala City (Guatemala), of an expert group meeting at the Central American level for the purpose of studying the problems and characteristics of the building materials industry in the region as well as the prospects for that industry.

## OBJECTIVES

4. The meeting had before it the following objectives:

(a) To analyse the situation of the building materials industry in the region, with particular emphasis on low-cost materials, for the purpose of achieving more coherent development in this sector and of making maximum use of the existing opportunities for complementarity within this industry in the region;

(b) To propose measures designed, through the creative use of regional co-operation, to overcome the principal obstacles currently confronting this industry;

(c) To select subjects that are relevant and of interest to the region and that may be the subject of further study by the UNIDO Secretariat as part of the process of preparing for the second world consultation on building materials.

## DOCUMENTATION

5. Annex II contains a list of the documents published for the expert group meeting.

## I. CONCLUSIONS AND RECOMMENDATIONS AGREED

### Summary description of the frame of reference

6. The building materials industry in Central America is currently experiencing a series of problems of a structural nature and in respect of productivity, value enhancement, concepts and institutions. By negatively affecting the rational use of the region's resources, these problems are making it impossible to satisfy adequately the housing needs of the most disadvantaged social strata of the population.

7. Among the structural problems, it has been observed that the development of the building materials sector is based on a building model that seeks to imitate the building logic of urban centres in the developed countries, with all that this implies for the design of building materials, the technology, the use of installed capacity, and the importing of inputs. Other structural problems that have been noted are connected with the lack of coherent and organic relationships between the industry's formal and informal sectors and the absence of adequate organizational structures in the informal sector.

8. Among the productivity problems, attention has been called to the lack of a proper understanding of social needs and of the demand for particular building materials, particularly in the informal sector, a circumstance that is preventing the right kind of production planning. Similarly, it has been pointed out that other factors that affect productivity are: inadequate organizational structures in the majority of enterprises; lack of training programmes, at both the operational and management levels, geared to the real situation in Central America; the poor quality of a number of products, especially in the informal sector; the faulty maintenance of the equipment used by this industry; and high transport and energy supply costs.

9. Among the problems in the area of value enhancement, the existence has been observed of marketing methods that promote speculation and rising prices, and of financing mechanisms that fail to promote national and regional building materials production.

10. It has also been noted that this industry lacks strategies, policies and programmes designed to make possible its integrated and coherent development through the adequate use of the region's human and material resources. Similarly, there is an absence of the kind of institutional framework that would promote co-ordination between the various social agents operating in the building materials industry.

11. The following conclusions and recommendations are offered in the context described above.

### CONCLUSIONS

12. The region must endeavour to rethink its development pattern for the building industry in order to make more rational use of regional resources and traditions and provide more adequate solutions to the problems that exist in Central America in the form of a housing shortage.

13. The high imported component that is typical of the region's building materials industry makes that industry vulnerable. In the face of this situation, the industry must undertake a creative search for mechanisms that will permit an appropriate selection of products and technologies so as to minimize the use of foreign resources.

14. The lack of appropriate machinery for the establishment of complementary ties between the formal and informal building sectors and industry is compelling those sectors to compete for existing products, thereby engendering a parallelism that is not without repercussions on the cost, quality and rational use of building materials.

15. The lack of adequate organizational lines within the informal sector is leading to a waste of material, economic and human resources which has negative effects on productivity and the result of which is that the sector is unable to lower its costs.

16. The low productivity associated with many building materials designed for use in the construction of housing for the low-income population has made it impossible to lower costs and, in this way, has limited the access of the lower-income strata of the population to this housing.

17. The absence of either tax or financing incentives as well as the limitations of the organizations and institutions engaged in promoting research and development in respect of regionally appropriate technologies has blocked progress towards solutions aimed at achieving lower costs in the construction of buildings, particularly when the latter are intended for the disadvantaged strata of the society.

#### RECOMMENDATIONS

18. The Governments of the region should formulate strategies, policies and programmes and should institute national and regional machinery designed to promote the production of building materials produced using local resources and intended for the construction of low-cost housing.

19. The private and governmental institutions should promote the more effective use of materials that are traditional in the region, such as adobe, wall structures consisting of cane and earth ("bajareque"), clay, tiles, stone and others.

20. Research must be promoted for the purpose of identifying new products and technologies based on regionally available resources. To this end, better use must be made of such regional and national research institutions as the Central American Research Institute for Industry (ICAITI), the Central American Higher University Council (CSUCA), the universities and the building industry chambers.

21. Consideration must be given to the rational use of wood, subject to each country's limitations, for the building of low-cost housing. At the same time, the forestation, reforestation and wood processing programmes of the Central American region must be strengthened.

22. The cement producers of Central America should promote research into and production of the pozzolana materials available in the region so as to encourage their use in the production of Portland cement varieties with pozzolana additives.

Similarly, the appropriate governmental and private institutions must promote the development of materials based on hydrated lime and pozzolana for various uses in low-cost building.

23. The region's financial and technological institutions should allocate resources for the production of machinery and equipment in the region for use in the manufacture of low-cost building materials based on resources available in Central America.

24. The appropriate governmental and private institutions must promote the organization of the informal sector of the building materials industry through associative forms of production and/or marketing in order that the informal sector may more easily acquire the inputs and equipment it requires for its production and may gain access to appropriate lines of credit.

25. A regional productivity programme must be formulated and implemented for the purpose of lowering the costs of the main building materials used in the construction of low-cost housing. This productivity programme must stress the aspects of enterprise organization, training at various levels, machinery and equipment maintenance, product quality, energy utilization and transport.

26. The governmental and private organizations engaged in the implementation of housing programmes should, with the support of the national standards-setting agencies and of ICAITI, give consideration to the possibility of initiating a programme for the standardization and modular co-ordination of building materials and products, with this programme to be aimed at the introduction of compatibility and uniformity in the corresponding technical standards of each country to the degree possible.

27. The legislation currently in force must be revised in order to eliminate from it any provisions limiting or discouraging production based on the locally available resources of the region.

28. Credits must be made available on preferential terms by the governmental institutions and regional financing institutions for the production of building materials based on regionally available resources and intended for the erection of low-cost housing. Similarly, those institutions that are currently engaged in standardizing and promoting the construction industry must give preferential treatment to materials of this type and must work towards better co-ordination between the formal and informal sectors and towards the structuring of the latter.

29. For the purpose of gaining a better understanding of the current situation and of the prospects for the building materials industry in the region, both SIECA and ICAITI must promote the collection, dissemination and exchange of information through an automated regional data system on production, technology, marketing, financing, costs, prices and legal aspects.

30. For the purpose of acquiring a better insight into the building materials industry of the region, it is necessary that SIECA/UNIDO should, provided the necessary resources are available, prepare studies aimed at identifying the requirements and demand for the principal building materials, as well as studies designed to identify the areas of specialization and complementarity among the various countries for the purpose of formulating coherent programmes of co-operation in the region and of giving greater substance to the strategies and policies to be devised for the building materials industry.

31. A committee of experts must be established in the region to advise SIECA/UNIDO on the preparation of the studies mentioned in the previous paragraph, and also to

promote regional co-operation and assist in following up the recommendations of the present meeting.

32. The Central American Bank for Economic Integration (CBEI) should promote the reactivation of the Permanent Central American Conference on Housing and Urban Development (COPVIDU), a voluntary regional forum that for 16 years has made possible an ongoing discussion of the specialized subjects of housing and territorial planning in Central America, and should assist in the new regional effort to find Central American solutions to the problems of building materials production.

33. The present meeting considered it useful to recommend to UNIDO that at the second world consultation on the building materials industry, to be held during the biennium 1990-1991, consideration should be given, as key discussion topics, to the manufacture of low-cost building materials for low-income housing and to measures for the strengthening of regional and interregional co-operation with a view to reducing the use of foreign exchange.

## II. ORGANIZATION OF THE MEETING

### Opening of the meeting

34. The expert group meeting was opened by the Secretary-General of the Permanent Secretariat of the General Treaty on Central American Economic Integration (SIECA). He described the role that SIECA was performing for the purpose of remaking Central American unity into a key instrument of the integration process. In this context, he referred to the situation facing the region as a process of seeking peace and of reinvigorating the quest for regional unity. With respect to the building materials industry, he noted the importance of this industry because of its multiplier effect within the economy, and he spoke of the need for the industry to base itself on regionally available resources, to which end research activities in the region had to be promoted.

35. The UNIDO representative at the meeting made a brief statement on the objectives and principal functions of the UNIDO System of Consultations, stressing the role that this System plays as a forum at which the various social agents (entrepreneurs, State, workers and research centres) participating in the development of a specific economic sector can present ideas aimed at increasing the developing countries' share in that sector's production and at qualitatively improving the development of the sector itself. He also took note of the activities that were going forward as part of the process of preparing for the second world consultation on the building materials industry, to be held during the biennium 1990-1991.

### Election of officers

36. Mr. Emilio Beltranena (Guatemala), advisor to the Cementos Progreso S.A. company, was elected Chairman.

### Approval of the agenda

37. The following agenda was approved:



1. Opening of the meeting
2. Brief description of the System of Consultations and of the process for the preparation of the second consultation on building materials
3. Election of the chairman of the meeting
4. Presentation of the agenda
5. Brief statements by participants regarding the situation of the building materials industry in the various countries
6. Discussion of the key issues presented in the discussion document
7. Approval of the meeting's conclusions and recommendations.

#### Approval of the conclusions and recommendations

38. At its closing session, on 27 October 1988, the meeting's conclusions and recommendations were approved by consensus.

### III. SUMMARY OF THE DISCUSSIONS

#### Presentation of the discussion document

39. The UNIDO representative presented the discussion document prepared by the Secretariat. He spoke briefly about the problems of the building materials industry in Central America and outlined the central issues of the discussion. The key problems noted included the following: the low utilization of installed capacity; the design of products and technology that did not permit more effective use of the region's resources; little complementarity between the formal and informal sectors; low productivity; and an institutional framework that was making it impossible to adequately promote the industry. In this context, he suggested that possible solutions to these problems should be discussed with the objective of formulating a plan of action for the region and also of recommending possible subjects for discussion at the consultation. A UNIDO consultant gave a brief presentation on the principal characteristics of the building industry of both the formal and the informal sector. Another consultant referred to the current situation of, and prospects for, the wood industry in the Central American region.

#### General discussion

40. One participant referred briefly to problems and prospects in respect of the various materials of the Honduran building industry. Regarding cement, he noted that his country had had a production deficit for that product until 1981, but that since 1982 domestic production had been able to cover the entire demand. He noted, however, that since August 1988 the installed capacity was well above the national demand, a situation that could trigger a crisis unless a substantial increase in the use of cement could be achieved. He also referred to the major characteristics of the sand-and-gravel, lime, and clay industries and of the industries engaged in the production of cement derivatives, fibre-cement, sanitation equipment and tiles, iron and iron derivatives, aluminium and wood. He concluded by noting that one of the main problems facing the building materials industry in his country was the lack of foreign exchange with which to import inputs, and also the industry's low productivity.

41. Another participant noted that in El Salvador not enough was known about the building materials market, particularly in the industry's informal sector. He also described as a constraint on the development of this industry the lack of continuity in the investment programmes promoted by the Government. Another aspect that was affecting the building materials industry was the abandonment of the traditional systems involving the use of locally available materials in favour of new products imported or processed with imported inputs. This participant also called attention to the fact that the informal sector was indiscriminately imitating the formal sector in its use of building materials, with the result that the scarcity of resources was exerting a negative economic impact on the formal sector. He spoke of the need to rationalize the building materials industry on the basis of a better definition of the materials to be used in the formal and informal sectors in order to avoid unnecessary competition between them.

42. One participant noted that in Costa Rica it was estimated that the housing shortfall was in the order of approximately 130,000 dwelling units. In order to help reduce this shortage, a programme to build 80,000 units had been established, with a National Housing Commission set up for this purpose. A financing system had also been put into place for the support of the programme. As a means of implementing this programme, not only was the system of self-construction being encouraged, but research programmes were also being carried out into low-cost building materials based on nationally available resources.

43. One participant spoke of the principal characteristics of the building materials industry in Nicaragua. He said that the existing installed capacity for the production of construction rods exceeded the internal demand, which had resulted in 65 per cent of the production being exported. On the question of the production of non-metallic products, he informed the meeting that cement production had fallen as a consequence of the measures adopted by the Government to restrict new investment. He also spoke of the rationalization taking place in the area of prestressing.

44. Another participant noted that the internal demand for cement in Guatemala exceeded the installed capacity of 500,000 tons a year. He said that it would be necessary to increase the current installed capacity by the year 1993. The possibilities of exporting cement had been explored, but without positive results. For the purpose of reducing the cost of cement, a set of measures designed to lower energy costs had been adopted. Along those lines, energy forests were being developed by making use of idle lands and conducting explorations for the detection of carbon reserves. Further, an effort was being made to move forward on a pozzolana cement project. There had also been a significant increase in the demand for lime. This participant pointed out that users were very sceptical as to the acquisition of prefabricated products, and that this type of material required more highly-skilled labour for its production. He noted the need for an expanded use of wood for internal housing construction, pointing out that between 80 and 90 per cent of the wood produced was currently being exported.

45. Several participants remarked that the region had been following a building model that to date had made it impossible to increase the use of traditional building materials (adobe, clay, tiles, stone, etc.), which had, however, given good results. Instead, the modernization process had led to the replacement of these traditional materials by new ones that required foreign imports for their manufacture, thus generating an increasing drain on foreign exchange reserves.

46. Some participants spoke of the need to base building activities using low-cost materials on regionally available resources so as to respond to the rising requirements for housing on the part of the low-income segments of the population.

They also noted that it was necessary to step up the productivity of the existing production units so as to cut costs and contribute in this way to the effort to make available less expensive housing.

47. A number of participants referred to the need to achieve greater co-ordination between the so-called formal and informal sectors. It was also urgently necessary to introduce a standards-setting programme in the region and to revise the existing legislation for the purpose of eliminating all obstacles to the production of building materials based on the region's internal resources.

48. Several participants stressed the need to promote and encourage the manufacture of machinery and equipment for the production of low-cost building materials. Along these same lines, it was urgently important, they said, to develop research programmes aimed at designing equipment and machinery within the region that was appropriate to its socio-economic conditions.

49. Mention was made of the importance of forming a permanent expert group that would give continuity to the present meeting and also serve as a forum for the consideration of ways of improving the current situation. Attention was also called to the need to reinvigorate the existing forums, such as the Permanent Central American Conference on Housing and Urban Development (COPVIDU).

50. A number of participants suggested to UNIDO and SIECA the need to support the development of the building materials industry through studies on the demand for building materials relevant to the region and through the search for suitable technologies for their manufacture. They also recommended that, as part of the process of preparing for the next world consultation, UNIDO should place emphasis on the whole question of the manufacture of low-cost materials for the construction of low-income housing, and also on the identification of mechanisms for the strengthening of regional and interregional co-operation with the objective of reducing the outflow of foreign exchange in light of the negative impact such expenditure was having on the balance of payments of the developing countries.

ANNEX I

List of participants

**COSTA RICA**

Mr. Maurilio Aguilar Rojas  
Adviser for Economic Affairs  
Chamber of the Industry of Costa Rica  
Calles 13 y 15, Av. 6  
San José

Mr. Carlos Quesada Chacón  
Head, Department of Engineering and Architecture  
National Institute of Housing and Urban Affairs (INVU)  
Apartado 2534  
San José

Mr. Oscar Madrigal del Castillo  
Programme Director  
Special Commission on Housing  
National Institute of Insurance, 50th Floor  
San José

**EL SALVADOR**

Mr. José Roberto Jiménez  
ECONSA  
Alameda Roosevelt 1802 (Tel. 28339)  
San Salvador

Manufacturer of machinery for blocks, paving stones, etc.

Machinery for the self-manufacture of cement floor materials using self-construction systems.

Machinery for the manufacture of floor bricks.

Advisory and development services for socially-oriented housing projects for low-income people.

Mr. Carlos Mauricio Rosales  
Vice-President of the Salvadorian Chamber  
of the Construction Industry (Tel. 23-4009)  
Salvadorian Chamber of the Construction Industry  
Regional Organization of Construction Industry Chambers  
CASAICO, Paseo General Escalón 4834, San Salvador

Ms. Martha Vilma Eugenia Mixco Lima  
Member, Designs Section (Tel. 26-7656)  
Salvadorian Foundation for Development and Minimum Housing  
Reparto Santa Alegría, Calle 6-B No. 7, San Salvador

**GUATEMALA**

Mr. Carlos Boubaud  
Representative of the Chamber of Industry  
MONOLIT  
Lotificación Mayan Gold, Villa Nueva

Mr. Fernando Jesel Sosa R.  
Director, Guatemala Chamber of Construction  
FERSUC  
15 Avenida 31-87 Zona 5

Mr. Jorge Lemcke  
Project Manager  
Cementos Progreso  
47 Calle 12-29 Zona 12, Villa Sol  
Finca La Pedrera, 15 Av. 18-01 Zona 6

Mr. Eduardo Quemé Coto  
Co-ordinator, Housing Sector  
General Secretariat of the National Economic  
Planning Council  
Edificio de Finanzas, Nivel 12

Mr. Emilio Beltranena Matheu  
Office of the Adviser on Technical Services  
Cementos Progreso  
Finca La Pedrera, 15 Av. 18-01 Zona 6

#### HONDURAS

Mr. Rubén Darío Sorto Santos  
Sales Manager  
Industria Cementera Hondureña  
Apartado Postal No. 244 (Tel. 33-1178)  
Telex 1250 INCEHSA HT  
Facs: 336158, Tegucigalpa

Mr. Roberto Antonio Casco  
General Manager  
Productora Hondureña de Concreto, S.A. - PROHCOSA  
Col Modelo, Tegucigalpa (Tel. 33-1377/1380/4226)  
Apartado Postal No. 870, Tegucigalpa

Mr. Julio César Espinal Zelaya  
Civil Engineer, Project Division  
Housing Institute (Tel. 32-8131/33)  
Boulevard Suyapa, Edificio Simón, Tegucigalpa

Mr. Jesús Simón Román  
Director  
Honduran Chamber of the Construction Industry  
Constructora Simón S. de R.L.  
Boulevard Suyapa 20, Piso, Edificio Simón  
(Tel. 32-5305/32-7534)

#### NICARAGUA

Mr. Ronaldo Bermúdez Calderón  
Director-General  
Metalworking and Building Materials Industry  
Ministry of Economic Affairs, Industry and Commerce  
Apartado No. 8, Managua

**Central American Research Institute for Industry (ICAITI)**

**Mr. Hugo Romeo Masaya Marotta**  
Avenida La Reforma 4-47 Zona 10  
Guatemala, C.A.

**Permanent Secretariat of the General Treaty  
on Central American Economic Integration (SIECA)**

**Mrs. María Teresa Arévalo de García**  
Official, Common Market Area  
4a. Avenida 10-25 Zona 14

**Mr. Raúl Valdez R.**  
Expert Official, Officer in charge of Energy  
Common Market Area  
4a. Avenida 10-25 Zona 14

**Mr. Alfredo Trinidad Velásquez**  
Co-ordinator, International Co-operation Committee  
4a. Avenida 10-25 Zona 14

**Mrs. Edna Gladys Valenzuela Obregón**  
Official, Common Market Area  
4a. Avenida 10-25 Zona 14

**Mrs. Diana Florentino de Mazariegos**  
Official, Common Market Area  
4a. Avenida 10-25 Zona 14

**Mrs. Laura Quinetros de Aguilera**  
Official, Common Market Area  
4a. Avenida 10-25 Zona 14

**Mrs. Carol Guillén de Palacios**  
International Co-operation  
4a. Avenida 10-25 Zona 14

**Mr. Carlos Martini**  
International Co-operation  
4a. Avenida 10-25 Zona 14

**United Nations Industrial  
Development Organization (UNIDO)**

**Mr. José Carlos Cano D.**  
Consultant  
Jr. Arica 115 - Of. 201  
Lima 18, Peru

**Mr. Mauro Anibal Mejía**  
UNIDO Consultant  
7a. Calle 27-30 Zona 7  
Guatemala

ANNEX II

List of documents prepared by the UNIDO Secretariat

Aspects of regional promotion and co-operation in the building materials industry in Central America	ID/WG.479/2(SPEC.)
Building materials in Central America	ID/WG.479/1(SPEC.)
Wood as a building material in Central America	ID/WG.479/3(SPEC.)