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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
UNITED NATIONS CENTRE FOR HUMAN SETTLEMENTS (HABITAT)

FIRST CONSULTATION ON THE CONSTRUCTION INDUSTRY

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REPORT

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Preface

The System of Consultations is an instrument through which the United Nations Industrial Development Organization (UNIDO) serves as a forum for developed and developing countries in their contacts and discussions directed towards the industrialization of the latter countries. Participants in the Consultations include government officials, as well as representatives of industry, labour, consumer groups and others, as deemed appropriate by the Governments concerned. The System facilitates negotiations among interested parties, at their request, either during or after the Consultation meetings.

Benefits deriving from this activity include the identification of obstacles to industrial development in developing countries; the monitoring of trends in world industry with a view to identifying action-oriented measures for increasing the industrial output of developing countries; and the search for new forms of international industrial cooperation in North-South and South-South relations.

Since the inception of the System[1] in 1975, Consultations have been held on the following industries and topics: agricultural machinery, building materials, capital goods, electronics, fertilizers, fisheries, food processing, industrial financing, industrial rehabilitation/restructuring, iron and steel, leather and leather products, non-ferrous metals, petrochemicals, pharmaceuticals, small- and medium-scale enterprises, the training of industrial manpower, vegetable oils and fats, and wood and wood products. The System brings together sectoral decision makers to deliberate on and propose concrete measures to accelerate the process of industrialization in developing countries. It has generated several innovations, particularly with respect to technological alternatives, integrated development and contractual arrangements. The many opportunities thus provided have led to the implementation of projects in technical cooperation, investment promotion and technology transfer.

The Consultation process, by virtue of its consensual and normative character, has revealed itself to be an efficient vehicle for fostering cooperation. It is eminently suited to assist Member States in the formulation of strategies and policies for industrial development.

The System of Consultations operates under the continuous and close guidance of the Industrial Development Board of UNIDO. In addition to undergoing annual reviews and occasional progress appraisals, the System was subjected to an in-depth evaluation in 1989, which concluded that it was making a major contribution to the development and formulation of UNIDO policies and programmes in specific sectors through integration and interaction with the other main activities of UNIDO.

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[1] *See Report of the Second General Conference of the United Nations Industrial Development Organization* (ID/CONF.3/31), chap. IV, "The Lima Declaration and Plan of Action on Industrial Development and Cooperation", para. 66.

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Introduction

1. The First Consultation on the Construction Industry was held at Tunis from 3 to 7 May 1993. The Consultation was part of the work programme of the System of Consultations for the biennium 1992-1993, which was approved by the Industrial Development Board at its sixth session.[1] It was attended by 175 participants from 41 countries and five international and regional organizations (see annex I below).

2. The Consultation was organized by UNIDO jointly with the United Nations Centre for Human Settlements (Habitat) and hosted by the Government of Tunisia.

Background

3. In preparation for the Consultation, UNIDO, with the participation of Habitat, organized a preparatory meeting at Tunis hosted by the Tunisian authorities from 24 to 27 February 1992. The objective of the meeting was to identify the main areas of interest to be considered at the Consultation. The meeting recommended that key topics should be developed in areas such as structure and function of the construction industry in the context of the developing countries, and social housing including environmental issues relating to sustainable development of the construction industry.

4. In order to refine these recommendations further, a global preparatory meeting was organized by UNIDO under the sponsorship of the University of California at Berkeley and the California Foundation on the Environment and the Economy, and held at Berkeley, United States of America, from 1 to 3 December 1992. The trends in the construction sector were analysed and major constraints identified. In addition, the meeting identified the basic issues that could be developed by UNIDO and Habitat for the Consultation.[2] A regional meeting was also held by UNIDO, in cooperation with the Arab Union for Cement and Building Materials, at Damascus, Syrian Arab Republic, from 10 to 11 February 1993. Its aim was to test the findings of the meetings held at Berkeley and Tunis against the concerns of experts in the construction industry in the Arab region and to draw conclusions for the consideration of the Consultation in its efforts to promote this sector.[3]

Objectives

5. The objectives of the First Consultation on the Construction Industry were primarily:

(a) To analyse the current situation of the construction industry and to identify the various constraints affecting its development;

(b) To assess the opportunities for increasing its managerial capabilities and of improving its performance;

(c) To examine the mechanisms for ensuing a balanced development between the formal and informal sectors and for increasing interaction between the different actors of the sector;

(d) To formulate development strategies and policies and make concrete recommendations to industrialists, Governments and the international community for the promotion of the sector;

(e) To identify technical cooperation projects and investment opportunities that could assist developing countries in their efforts to develop their national construction industry.

6. Based on the preparatory work done by the Secretariat and the conclusions and recommendations of the global and regional preparatory meetings, the following issues were developed by UNIDO and Habitat and proposed for discussion at the Consultation:

Issue 1: Prospects for the development of the construction industry in the developing countries;

Issue 2: Promoting sustainable construction industry activities.

Agreed conclusions and recommendations

7. The Consultation agreed on the conclusions and recommendations set out below.

Issue 1: Prospects for development of the construction industry in the developing countries

8. The Consultation recognizes the importance of the construction sector in the socio-economic development process. It further recognizes the complexity of the construction industry, which is derived from its fragmented nature and insufficient operational relationships between the main actors such as professionals, contractors, and suppliers and manufacturers of building materials. The inadequate working relationships between researchers, investors, and policy makers is also recognized. That situation prevents a proper formulation of policies and strategies for the development of the construction industry. A national mechanism is thus called for to facilitate interaction between the main actors and to coordinate, spearhead, promote and monitor the development of the construction industry in a coherent and integrated manner in many developing countries.

9. The lack of continuous linkages between research and development, specialized institutions and field operations is a major obstacle to improving the performance of the construction industry in areas such as technology innovation, productivity, quality assurance and safety in construction operations. Governments in disaster-prone areas should establish programmes in these areas especially to rehabilitate building stock.

10. The liberalization measures currently being introduced in many countries should substantially improve growth potential and cost-effectiveness by attracting more investment to the sector. The construction industry should respond to these changing economic and industrial scenarios in accordance with local objectives and priorities.

11. To cope with the highly fluctuating and cyclical nature of the construction market, and to protect small contractors' undertakings, there is a need to introduce measures to stabilize the various sectoral demands for construction.

12. Generally, the maintenance and rehabilitation of buildings and infrastructure are neglected aspects of construction activities in developing countries. Governments should set up policy guidelines for integrating maintenance and rehabilitation into cost analysis and estimating and contracting procedures for new projects. Steps should also be taken for the adequate maintenance of existing housing stock, service networks and other infrastructures.

13. The inadequacy and insufficiency of databases and consolidated statistical information on the demand side relating to the various aspects of construction activities in different sectors of the economy prevents a clear identification of critical areas for forward planning and forecasting processes with a view to meeting the demand for housing, buildings and physical infrastructure. There is a need for an information system covering the different sectoral requirements - building materials, equipment and human resources - for the production of buildings and infrastructure works.

14. Quality in construction is closely associated with the level of technological development in a country. As a result of dependency and a preference for labour-intensive construction methods in

many developing countries, the desired levels of quality are difficult to achieve. Appropriate technology, including selective mechanization, proper use of building materials, demonstration schemes, in addition to education and training, is necessary to enhance efficiency and productivity.

15. A national consensus on quality levels for building materials and construction between all the actors, including the end-users, should be established in each country. This should facilitate the progressive formulation and application of codes, standards and regulatory measures.

16. A continuous search to identify innovative and cost-effective technological options to ensure the durability and longer life-expectancy of buildings and structures should be encouraged and pursued through well-established performance appraisal and validation mechanisms.

17. For the effective development of the construction industry, appropriate strategies and programmes are required to facilitate the development, selection and application of viable technologies suited to local conditions and resources.

18. Professional associations, in addition to architectural and engineering design consultancy services, have an important role to play in the construction sector. The contribution of such associations can be instrumental in reducing both design and construction time and controlling construction costs. Coordinated action is imperative to maximize the inputs of these associations in order to improve cost-effective performance.

19. Entrepreneurship in the contracting business in most developing countries is hampered by the lack of legislative support for the contracting process. Partnerships through joint ventures between domestic and foreign companies should be encouraged. Furthermore, joint-venture contractual arrangements should generate the capability required for repair and maintenance. Capacity-building programmes for local industry should also be strongly supported by appropriate instruments in order to help bring about a balanced business relationship.

20. To achieve efficient scheduling, timely completion and cost control in construction operations, sound management practices, including contract management, are called for. Therefore, there is an urgent need for training and retraining of professionals and technicians and skill formation at all levels as part of an integrated human resource development strategy.

21. The transfer, application and dissemination of technology properly supported by a policy and institutional framework are required to promote construction and building materials enterprises and to increase the overall efficiency of construction delivery systems. The sharing of experience and expertise among developing and developed countries is necessary to reinforce the capability and to enhance the competitiveness of local construction industry.

22. Recognizing the effects of population growth and migration trends in the majority of the developing countries, the Consultation draws attention to the urgent need for improving land-management practices to meet the increasing demand for housing, industry, transport and communications as well as social infrastructure facilities.

23. In order to meet the basic needs of the shelterless, the inadequately housed and the economically weaker sections of the population, efforts should be made to increase the production of sustainable and cost-effective building materials and components, preferably based on industrial wastes and agricultural residues. Also efforts should be made to develop a decentralized delivery system through building centres to manufacture these building materials and components locally and to make them available to such sections of the population.

24. The limited financial resources of the different public agencies and private enterprises inhibit a uniform growth of building materials production and construction activities. In addition, poor access to credit and finance for contractors, small- and medium-scale entrepreneurs and the clients further complicates the problems of adequacy of resources for this industry. An innovative public policy framework should be developed and established in order to create an environment conducive to strengthening the financial base of the construction industry.

25. Given the rapidly increasing demand from various sectors of the economy, the consumption of energy in the production of building materials, the construction process and the use of buildings should be given due consideration. Adequate energy conservation measures should be taken into account at all stages including planning, design and selection of technologies.

Issue 2: Promoting sustainable construction industry activities

26. The Consultation notes with appreciation that by including a separate programme area on the construction industry in Agenda 21, the United Nations Conference on Environment and Development recognized the importance of sustainable construction industry activities in the socio-economic development of all countries.[4]

27. Environment-friendly construction is not synonymous with a halt or decline in developmental efforts. The long-term benefits of sustainable construction activities should not be ignored as a result of a consideration of short-term costs alone. Nevertheless, measures have to be based on specific country contexts with due regard to the priorities and resource situations.

28. The need for the sustainable development of the construction industry should be reflected in the development planning process. In this context, capacity building in the area of resource management should be given special priority. National science and technology policies should promote the introduction of clean and energy-efficient technologies in the construction industry including building material manufacturers.

29. Resolving conflicts in land use and attendant environmental degradation requires reforms in current land-use planning and management practices. Environmental impact assessment should be made mandatory for all construction and mining activities.

30. Awareness-building and education are key components in creating an environmentally sensitive clientele for the construction industry. Environmental consciousness should be inculcated through school and university curricula and the in-service training of professionals in the construction industry. Public awareness can be enhanced through appropriate programmes coordinated by advisory bodies such as environmental protection councils.

31. Non-governmental organizations dedicated to environmental causes can serve as special-interest groups promoting sustainable construction practices. Effective communication between all relevant actors including professional bodies and trade associations is also essential. The participation of women in the construction industry should be enhanced at all levels.

32. Research efforts should be intensified in developing techniques, materials and practices relating to the management of non-renewable resources and environmentally sound construction. Special attention should be given to the recycling and reuse of waste materials, the cultivation of fast-growing trees and the preservation of secondary species of timber. The development of environmental accounting methods in the construction industry is another priority area for research.

33. With a view to enhancing resource-management capacity, especially in the least developed countries, and broadening the range of local building materials, the UNIDO programme on the integrated utilization of non-metallic minerals should be further strengthened.

34. Design practices should introduce the life-cycle approach in the selection of materials for construction. Measures should be taken to promote the increased use of low-energy and recycled materials and the efficient use of high-energy materials. Mechanical heating, ventilation and cooling systems should be discouraged as far as possible by the efficient design of building forms and mass. Energy audits for buildings should be made standard practice.

35. Incentives should be given for the introduction of energy-efficient and low-polluting technologies in the manufacture of building materials. These technologies should be complemented by effective regulatory measures. In addition, Governments should stipulate conditions for modernization including the introduction of environment-friendly technologies. In general, the polluter-pays principle should be applied in controlling pollution in the building materials industry.

36. Governments and the private sector should promote the increased use of locally produced building materials and labour-intensive techniques. The use of low-energy and environmentally sound materials should be specifically incorporated in contract specifications.

37. The exchange of information and experience between the developing countries and between the industrialized and developing countries can enhance the adoption of sustainable construction practices in developing countries. The development of databases for the construction sector, incorporating energy and environment-related information, will support this process.

38. Capacity-building is crucial to prevent the transfer of polluting and wasteful technologies from developed to developing countries and to manage the transfer of low- and non-waste technologies to the best advantage of recipient countries. This is an important area where the international community should assist the developing countries in capacity-building at the national level to deal effectively with environmental problems related to construction. Developing countries should use the funding mechanisms available such as the Global Environment Facility for pollution abatement in the construction industry.

39. Regional cooperation between developing countries can be cost-effective, especially in the areas of environmental research, formulation of standards and human resource development. Such cooperation should be strongly encouraged.

40. Agencies in the United Nations system should join efforts to support developing countries in adopting sustainable construction practices. Habitat and UNIDO should initiate a suitable programme to sensitize policy makers and planners in developing countries to the need to develop domestic capacity in sustainable construction activities at national and regional levels.

I. Organization of the Consultation

Opening of the Consultation

Statement by the Prime Minister of Tunisia

41. The Prime Minister of Tunisia conveyed the greetings of the President of the Republic who, he added, had kindly offered to place the event under his patronage. The Prime Minister also welcomed the participants on his own behalf and thanked those who had contributed to the organization of the Consultation. He stressed its importance as an opportunity for reinforcing cooperation, exchanging information and exploring technological advances in the construction industry.

42. The Prime Minister drew attention to several initiatives taken by Tunisia since 1987 such as the introduction of new legislation and incentives in order to provide better control of the construction sector within the context of the national economy. Those initiatives were part of the continuous efforts of the Government to foster development and progress. Discussions during the Consultation meeting on such issues as quality in construction, social housing, energy and environment were, therefore, highly relevant to those efforts and indeed to similar efforts of other countries in the context of their social and economic policies.

43. The Prime Minister said that, between 1984 and 1992, the number of housing units in Tunisia had increased by 240,000. As a result of the promotional policy and national efforts, 81 per cent of families owned proper homes. The Eighth Development Plan (1992-1996) was aimed particularly at improving the living conditions of low-income families, and increasing production capacity, including the provision of services for land designated for development. Both the public and the private sectors were cooperating closely in the housing construction programmes. He concluded that the sector required closer cooperation and partnership at the regional level and that the Consultation offered an opportunity for promoting the construction industry to that end.

Statement on behalf of the Director-General of UNIDO

44. The Deputy Director-General of the Department for Industrial Promotion, Consultations and Technology, speaking on behalf of the Director-General of UNIDO, expressed his deep appreciation to the host Government for the courteous welcome extended to the participants and the efforts made to ensure the quality and success of the Consultation. That gratitude was all the more profound as His Excellency the President of Tunisia had generously decided to place the Consultation under his patronage. He expressed particular gratitude to His Excellency the Prime Minister of Tunisia for finding the time, given his extremely busy schedule, to attend the meeting. He went on to say that most of the developing countries were not able to meet the enormous need for housing, social structures, institutional buildings and infrastructural works because of such basic constraints as a lack of managerial skills and entrepreneurial capabilities, financial resources and a domestic supply of materials, thus leading to an increased reliance on imports including technology.

45. The construction industry was a strategic instrument for social and economic development as well as a contributor to capital formation and growth. Given the labour intensity of its operations, the

industry offered great potential for employment generation and a more balanced approach towards development. Properly nurtured, the industry could bring about the emergence of a much-needed class of entrepreneur and manager who could provide the developing countries with a proper foundation for competitiveness at the national and regional levels. Nevertheless, the construction industry was all too often ignored by such major actors as planners, administrators and decision makers.

46. Recent developments related to economic transformation and restructuring processes in many former centrally planned economies had created considerable competition for investment capital and development assistance. If those developments led to a change in the priorities of donor countries, the consequence could be a drastic reduction in much-needed development funds for the developing countries. The decision of UNIDO to focus on the construction industry was mainly based on the sector's importance to the economies of the developing countries and its linkages with other key economic activities: transportation, energy, forestry, commerce and banking. UNIDO was thus giving due consideration to the environmental impact and sustainable development of the construction industry.

47. The Consultation constituted an instrument for determining the appropriate policy approach to, and creating a climate favourable for, the improvement of the construction industry in addition to ensuring long-term benefits for the developing countries. The Deputy Director-General concluded that, in a broader context, the search for viable solutions to overcome the constraints on the sector would be driven by the desire to enhance international cooperation including cooperation between developing countries.

Statement on behalf of the Officer-in-Charge of Habitat

48. The representative of Habitat, speaking on behalf of the Under-Secretary-General and Officer-in-Charge of Habitat, expressed his confidence that the Consultation would provide the framework for coordinated action with a view to enhancing the contribution of the construction industry towards social and economic development. The Consultation was taking place at a time when developing countries were making considerable efforts to meet their basic needs for shelter, infrastructure and services in an increasingly difficult economic climate.

49. The challenge for the construction industry in many industrialized countries consisted mainly of meeting the demand for rehabilitation, renewal of inner-city areas and new investment in infrastructure. The priorities in the developing world were different. Nevertheless in each case, the industry displayed many similarities such as its fragmentation, its floating labour force, the slow pace of technological innovation and the lack of investment in research.

50. The industry also suffered from a fluctuation in market demand (which depended basically on public-sector investments) and a lack of long-term planning. In any strategy for market consolidation, the strengthening of the capabilities of small contractors in the informal sector should not be ignored in the priorities. Also, a major consideration for the small entrepreneur would be improving current legislation and contract procedures that would be instrumental in reducing risks.

51. With increasing urbanization, the developing countries were rapidly moving towards the use of building materials that required more energy to produce. The reversal of current trends called for an effective strategy to promote energy-efficient, low-polluting construction technologies including the recycling of wastes. There was an urgent need in the developing world for local capacity-building in areas such as pollution abatement as well as in the management of non-renewable resources in the construction sector.

Statement by the Officer-in-Charge of the System of Consultations Division

52. In his introductory statement, the Officer-in-Charge of the System of Consultations Division stressed the key role of the construction industry in the overall economic development of a country on account of, among others, employment generation and the interlinkages with various sectors of the economy, in particular, with large-scale as well as small-scale producers of building materials. Yet, despite the efforts of many countries in Africa, Asia and Latin America, the indigenous construction industry had not been able to contribute fully to the development objectives in those countries.

53. He pointed out that the construction industry should be analysed in its entire complexity so that innovative approaches and constructive recommendations, such as those emanating from the Consultation, could be usefully applied in the process of promoting the industry for the benefit of the developing countries. Ways and means should also be found of meeting the growing concern in those countries about rising construction costs and of reducing their reliance on imports of technology and expertise.

54. In his opinion, the issues developed by UNIDO and Habitat offered a broad and comprehensive approach for the discussions. Issue 1 presented an overview of the characteristics of and the main constraints on the sector in addition to focusing on key areas such as financing, management, human resource development and the role of the State. Issue 2 highlighted the major environmental damage caused by construction activities and their impact on non-renewable resources for raw materials. Those issues also offered an opportunity for defining the role of Governments in promoting sustainability in the development of the construction industry.

Presentation of the activities of UNIDO

Industrial operations

55. A representative of the Industrial Operations Technology Division pointed out that, despite the efforts made to improve conditions, standards of living in the developing world had been deteriorating. Essential needs such as housing, infrastructure and services had not been properly met. The low level of investment in construction, in addition to the reliance of many countries on imported technology and building materials, had not contributed to development. Self-reliance and self-sustainable development were an integral part of the strategy for the promotion of the construction industry including the building-material sector.

56. He said that environmental issues relating to the construction industry as a whole should be well understood so that its positive contribution towards improving ecological sustainability could be achieved. The Ministerial Conference on Ecologically Sustainable Industrial Development, convened by UNIDO at Copenhagen in October 1991, had provided the means to incorporate environmental considerations into the operational and investment-related activities of the Organization. Furthermore the United Nations Conference on Environment and Development, under Agenda 21,[4] had given a mandate to the entire United Nations system to promote sustainable construction industry activities and the sustainable utilization of natural resources.

57. In addition to increased efforts to promote the development of small-scale as well as large-scale manufacture of building materials, UNIDO played an equally key role in conjunction with other international agencies in improving construction techniques for disaster-prone regions, strengthening human resources and promoting ecological sustainability.

58. The representative said that the Consultation had assumed a new dimension owing to the two important aspects of the construction industry; namely, its impact on the environment and its role as the provider of shelter, services, infrastructure and employment. Despite efforts by all the parties involved, including Governments and international organizations and the construction industry itself, the gap between output and demand was increasingly widening. The fragmented nature of the industry, the lack of interaction between the main actors and ineffective organizational support were major factors inhibiting the performance of the construction sector.

Investment promotion

59. A representative of the Industrial Investment Division explained that the objective of the investment promotion programme of UNIDO was to create in the requesting countries a national environment favourable to investment opportunities. The programme also helped the entrepreneurial sector in developing countries to mobilize foreign investment for the rehabilitation of existing, or the creation of new, enterprises.

60. UNIDO was in a position to identify, formulate, select and promote investment projects in addition to mobilizing the necessary technical expertise and providing appropriate assistance, namely, the procurement of machinery and equipment including training. The formulation phase of the project was processed through the Project Profile Screening and Pre-appraisal Information System (PROSPIN). Furthermore, close cooperation was maintained with international regional and national financing institutions as well as with potential partners. Close cooperation was also maintained with the local business community through the well-established network of Investment Promotion Services located in Asia, Europe and the United States of America.

61. He added that the scope of the investment promotion session within the context of the Consultation consisted of facilitating contacts and negotiations between the promoters from different parts of the world present at the Consultation. Negotiations were to focus, *inter alia*, on capital participation, commercial arrangements and transfer of technology including training, maintenance and managerial assistance.

Presentation of the activities of Habitat

62. A representative of Habitat outlined a number of activities carried out by Habitat, including research, which took into account the multifaceted nature of the construction industry. The focus was mainly on policy issues related to the situation in the developing countries as well as innovative technical aspects relevant to the industry in those countries.

63. He pointed out that Habitat organized workshops, seminars and expert group meetings whose objectives consisted of identifying constraints on and assessing trends in the sector so that appropriate policy and strategies could be formulated to improve the productivity of the industry.

64. Other important areas were improving and modernizing construction design, quality inspection and research capabilities in different countries; for instance in Cuba, Democratic People's Republic of Korea, United Arab Emirates and Viet Nam. Efforts were also concentrated on promoting and improving building and infrastructure maintenance practices. During the biennium 1990-1991, national workshops on building maintenance strategy had been held in India, Kenya and Singapore. The conclusions reached at those workshops had contributed to the preparations for an international meeting convened at Sofia, Bulgaria, at which specific recommendations were made relating to policy and legislation, financing and cost recovery, as well as management and technical aspects.

65. He also said that Habitat was providing assistance in disaster-prone regions. Within the framework of the medium-term plan 1992-1997, Habitat would concentrate its efforts particularly on strengthening the capability of the small-scale construction sector. Efforts would be equally extended to entrepreneurship development as well as community participation and women's involvement in the construction of shelter.

Presentation by the Director-General of the Technical Centre for Building Materials, Ceramics and Glass

66. In his introductory remarks, the Director-General of the Technical Centre for Building Materials, Ceramics and Glass (CTMCCV) outlined the basic elements of the policy and achievements of the social housing programmes undertaken in Tunisia since its independence in 1956. Three stages had characterized the development of the social-housing sector. The first stage consisted of establishing the National Real Estate Company (SNIT), which had been instrumental in providing some 50,567 dwellings between 1957 and 1974.

67. Until 1975, SNIT had had a quasi-monopolistic control over the social-housing market and, despite its efforts, there had been little amelioration of the housing crisis. To alleviate the situation, suitable legislation had been put into effect including administrative decentralization with a view to encouraging real-estate promoters. The second stage, between 1975 and 1985, saw a proliferation of real-estate organizations including the National Company for Social Housing Promotion, whose basic aim was to build and lease the resulting dwellings. At the same time, the Land Settlement Agency was created in order to curb land speculation and provide appropriate services. The third stage was initiated in 1982, with the participation of the private sector, to set in motion a process of developing social housing. During the period 1982-1986, the production of housing reached an average of 50,000 units annually, a ratio that was estimated at about 6 units per 1,000 inhabitants.

68. The informal sector had also contributed to raising the housing stock by some 13,000 units during the same period. He said that major problems remained such as the proliferation of spontaneous or unauthorized housing, which had risen from 25 per cent of overall construction between 1982 and 1986 to 35 per cent between 1987 and 1991. Rising construction costs were another area of concern and local promoters were undertaking pilot housing operations in order to reduce costs.

69. He also noted that over the years promotional institutions had adjusted their policy *vis-à-vis* the clients, as shown in the drastic reduction in the proportion of housing for rent to housing on direct sale to new home-owners. Ownership was facilitated within the framework of the Tunisian housing policy by the establishment of the Housing Bank (Banque d'Habitat), which provided private individuals with suitably adjusted financing. Credits could also be obtained from other support services such as the National Housing Aid Fund.

70. The housing problem had been addressed through close interaction between both the public and private sectors, in addition to the structural readjustments of the existing mechanisms according to market demand. He said that appropriate Government regulations and incentives within the framework of a long-term policy of promotion had also been instrumental in responding to the challenge.

Election of officers

71. The following officers were elected:

Chairman: Laabidi Barhoumi (Tunisia), Président Directeur général, Centre technique des matériaux de construction, de la céramique et du verre

Vice-Chairmen: Trijugi Nath Gupta (India), Executive Director, Building Materials and Technology Promotion Council, Ministry of Urban Development

Pierre Chemillier (France), Président, Centre scientifique et technique du bâtiment

Gibson G. Maina (Kenya), Deputy Director, Kenya Building Research Centre, Ministry of Public Works and Housing

Ahmad Al-Rousan (Jordan), Secretary-General, Arab Union for Cement and Building Materials

Philippe Fortuney (Venezuela), Profesor, Facultad de Arquitectura, Universidad del Zulia

Rapporteur: Trijugi Nath Gupta (India)*

Adoption of the agenda

72. The Consultation adopted the following agenda:

1. Opening of the Consultation.
2. Election of the Chairman, Vice-Chairmen and Rapporteur.
3. Adoption of the agenda.
4. Presentation of the issues by UNIDO followed by general discussions on:

   Issue paper 1: Prospects for the development of the construction industry in the developing countries

5. Investment promotion session.
6. Presentation of the issues by Habitat followed by general discussions on:

   Issue paper 2: Promoting sustainable construction industry activities

7. Presentation and adoption of the conclusions and recommendations.
8. Closure of the Consultation by the Secretary of State of Commerce of Tunisia.

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*It was decided that one of the vice-chairmen should also act as the Rapporteur.

Documentation

73. The documents issued prior to the Consultation are listed in annex II.

Adoption of the conclusions and recommendations

74. The conclusions and recommendations of the First Consultation on the Construction Industry were adopted by consensus at the final plenary session on 7 May 1993. The Secretary of State of Commerce of the Ministry of Industry of Tunisia, in his closing remarks, thanked the chairman as well as UNIDO and Habitat for the successful organization of the Consultation. He conveyed his appreciation to the participants for their highly professional contribution to the discussions.

II. Report of the plenary sessions

Presentation of the issues

Issue 1: Prospects for the development of the construction industry in the developing countries

75. A representative of UNIDO presented the first issue paper to be discussed by the Consultation. He noted that, despite the key role of the construction industry as a major contributor to economic development and employment generation, the industry had not found a proper place in the development strategies of the majority of the developing countries. It was, however, well exposed to government initiatives and, in most cases, the Governments were responsible for a large part of the demand for construction.

76. He pointed out that the construction market was constrained by a lack of investment. While the level of construction output required to maintain economic growth was very high, indigenous financial resources for investment were nevertheless limited. Other major constraints were manifold. Backward and forward linkages with other economic activities had not been consolidated owing to the fragmented nature of the industry; in addition, the role of the main actors was not necessarily conducive to promoting the industry in a concerted manner.

77. Fluctuation on the demand side was a major risk factor for many entrepreneurs, particularly the small ones. Reliance on imported technology and know-how caused the depletion of hard currency reserves. Poor skills and the lack of managerial capabilities constituted major areas of concern as did limited access to financing. The slow pace of adaptation to the new technologies required to improve performance and reduce completion time was also a major obstacle.

78. Planning and forecasting in many developing countries were inhibited as a result of the inadequate statistical coverage of the sector. Closer cooperation was necessary between the main actors including the professionals for innovative design approaches and construction management techniques that would result in more efficient cost control. The high costs of energy in the production process of building materials was also mentioned. The Consultation, he concluded, should focus on constructive approaches, including changes in current policies and practices, for a more competitive construction industry in the developing countries.

Summary of discussion

79. A participant pointed to the lack of coordination on matters relating to construction. In his country, for instance, four ministries were responsible for different aspects influencing the industry: urban planning, housing, environment and mining were each the responsibility of a different ministry. Decision makers were operating separately and no coordinating mechanism existed that could allow the key actors to interact at the policy level. He advocated that the decision-making process involving construction matters at the governmental level should be integrated.

80. Many participants emphasized the lack of entrepreneurship and capabilities of contracting firms as serious obstacles faced by the industry in the developing countries *vis-à-vis* the market demand. Professional as well as contractors' associations had no participation in policy and strategy matters for the development of the sector; additionally they were not equipped to operate as promotional instruments in most developing countries. Current contracting and subcontracting practices inhibited the fair participation of many firms, particularly those from the small-scale sector, in tendering procedures and sharing of construction contracts.

81. Forward planning, as indicated by one representative, was a paramount necessity if shelter was to be adequately provided for the increasing population in the developing countries. Migration from rural areas to urban centres further aggravated the problem. A representative of a regional institution in Africa estimated that about 10 million shelters were needed per year in that continent. The shortage of consulting firms, technicians and financing was part of the problem of responding to market demand for housing and shelter. He noted that international assistance was necessary to provide training to professionals with a view to mastering low-cost construction techniques and reducing the production costs of mass-housing projects.

82. Construction costs were a matter of concern to all the participants. As indicated by one participant, the acquisition of land for construction often raised the cost of a project by 20-30 per cent; another contributory factor was the low productivity of the building materials industry. In many developing countries the production of local materials could meet about 40 to 50 per cent of local needs; as a result the supply gap was compensated by imports. Inflation was an additional element that had an impact on costs in the industry.

83. The small size of the market in many parts of the developing world coupled with the problems of transportation made it difficult for entrepreneurs to increase the production of materials and components to satisfy demand on a regional scale. In the case of the Middle East, for instance, a participant emphasized that there was a great potential for a regional market in the construction industry but the lack of coordination networks and legislative support inhibited initiatives for expansion. He noted that appropriate standards that could be applicable to most of the countries in the region were lacking. At the local level, there was a lack of policy frameworks within which both the production of building materials and construction could be promoted simultaneously. Also, international assistance was essential to Governments and professionals in the region in their coordination efforts.

84. The issue of quality in construction was raised by many participants. The concept of quality should not be conceived at the execution level but should be part of the process from conceptual design through to the production of materials and components. Different levels of quality should be categorized at the national level. One participant stressed that market information systems should also be developed, including specifications, so that professionals and end-users could identify and select suitable options. Furthermore, human resource training in addition to research on appropriate choice was the key element in achieving satisfactory quality results. A quality control mechanism should be provided in the production phase, which could be a stimulating factor in the promotion process.

85. One participant stressed that the promotion of the construction industry should be concentrated basically on the housing sector. In many developing countries, he noted, the construction of international hotels, banks and government buildings were often realized by foreign firms sometimes in association with local counterparts. Moreover, the execution of a construction programme should not depend on technical matters only. Different actors were involved including entrepreneurs, developers, producers of materials in addition to the *maître d'ouvrage*. Close cooperation was thus

needed between them in which case the State could play a major role owing to its knowledge of the various parameters involved, including regulations.

86. The role of the informal sector was also discussed. As an important economic contributor to construction activities in the developing countries, that sector should not be marginalized. In reality there was no clear distinction in the industry between the formal and the informal sectors. Furthermore, the communal participation of the inhabitants in the construction of their dwellings should be encouraged and assisted. He advocated the creation of appropriate distribution centres of building materials especially suitable to the informal sector. Nevertheless, quality control and certification of those materials must be provided by credible laboratories and testing centres.

87 One participant highlighted the major difficulties in the construction industry in his country in East Africa, which made it unable to propel itself into sustainability. Existing policies and regulations relating to the housing sector, for instance, tended to promote short-term, private benefits at the expense of long-term collective interests. Another case in point was the predominance of large contracting firms. Small contractors were marginalized and had no access to financing.

88. The same participant remarked that the lack of training was a major handicap faced by the small sector. He noted that, in 1991, a bilateral agency had initiated an on-the-job training programme for local small contractors in labour-intensive techniques for rural roads. Despite the success of that programme, equivalent training had not been contemplated for the construction sector nationwide. He stressed the need for setting up a Sustainability Resource Centre for the Construction Industry for which valuable information was necessary on issues relating to sustainability, specifically on environmental as well as politico-economic matters. He also noted the need for improving communications and interaction between the key players in the industry.

89. Another participant pointed out that the industrialization of construction in developing countries should not be considered before an in-depth assessment of the needs of the country had been undertaken with due consideration of the local realities. Successful industrialization schemes applied in developed countries were not necessarily transferable to developing countries. For instance, construction was becoming progressively more industrialized in the developed countries out of the necessity of reducing labour. In the developing world, labour was abundant and consequently not a constraint. In addition, climatic conditions did not constitute an obstacle to construction activities.

90. He added that the industrialization process in the developing countries should focus on quality, which would encourage investment in equipment. Another basic area to take into account was energy saving in buildings such as offices, hotels and housing through appropriate architectural solutions, solar protection, thermal insulation and ventilation. He particularly stressed the need for the utilization of substitute materials as opposed to those produced from non-renewable resources. In this context research and testing centres could play a key role in fostering the industrialization process of the construction industry.

91. Referring to the question of transfer of technology, one participant from an industrialized country expressed the view that, in many cases, technology transfer was an opportunity for the suppliers to test their machinery and/or products under specific field conditions in the developing countries. In other cases, the transfer could be for promotional purposes. Another participant suggested that international agencies should assist developing countries in the process of technology transfer and, in addition, enhance their negotiating capabilities so that more equitable benefits could be shared by all the parties involved.

92. It was also emphasized that in order for the transfer of technology to be effective it would be essential to establish a coordination body, the task of which would also include the diffusion of appropriate technological information to the domestic construction sector. As a complementary measure local capacity should be reinforced and human resources developed and trained in adapting the technology thus transferred to local use.

Issue 2: Promoting sustainable construction industry activities

93. A representative of Habitat presented the second issue paper for discussion at the Consultation. Addressing the question as to why environmental considerations required the special attention of the construction industry and national Governments, he highlighted various factors responsible for the growing unsustainability of current construction practices. One was the increasing pressure on land imposed by the rapid urbanization process in most developing countries. Much of the land available for development in and adjoining cities was not suitable for construction. Yet, because of the scarcity of land, construction was taking place on forest and agricultural lands, eco-sensitive wetlands, steep hill slopes, lands abutting hazardous industrial plants etc. All those activities were destabilizing fragile eco-zones and increasing the vulnerability of the environment.

94. He then referred to the rapidly escalating construction costs, which could be attributed to the increasing use of non-renewable resources by the industry. With urbanization, there was an increasing tendency to use energy-intensive materials. The construction industry was also a major user of sawnwood and wood-based products, which were derived from primary species of timber. Many of the tropical species of timber used by the industry were already facing extinction.

95. The construction industry was also a major polluter of the environment. An estimated 8-20 per cent of carbon dioxide and other greenhouse gas emissions could be traced to construction and building material production activities. Of particular concern was the continued use of chlorofluorocarbons (CFCs) by the industry. Although the volume of CFC emissions was low, it had a disproportionately high impact on the climate.

96. In Agenda 21,[4] the direct relationship between sustainable human settlement development and sustainable construction industry activities had been brought to the fore by including the promotion of sustainable construction industry activities as a distinct programme area in the recommendations under chapter 7 (Promoting sustainable human settlement development).

97. He pointed out that reversing the current trend of environmental degradation by construction activities called for concerted action by the industry, national Governments and the international community. The adverse environmental effects of construction could be reduced by careful land-use planning, sustainable management of timber and other forest resources, increasing the use of wastes and recycled materials and reducing energy consumption by the industry. Stressing the importance of energy management in construction activities, he mentioned that savings could be achieved by: (a) efficient use of energy-intensive materials; (b) greater use of low-energy materials; and (c) improving the energy efficiency of building materials production. There was also considerable scope for energy conservation in buildings in use; for example, through improved insulation and the use of passive solar designs.

98. Finally, he stressed that developing countries should act then as continued inaction would only increase the costs of the necessary reforms. The developing countries could also reduce construction costs significantly by improving energy efficiency in the construction industry. He pointed out that international development assistance was likely to be increasingly linked to sustainable construction

practices in the future. In addition, several opportunities for international support were available to developing countries such as the Global Environment Facility (GEF), jointly managed by the United Nations Development Programme (UNDP), the United Nations Environment Programme and the World Bank. Referring to the international community, he identified three areas for priority attention: (a) formulation and implementation of national protocols for environmental protection; (b) transfer of new technologies and local-capacity building; and (c) financial support for environmental protection measures.

Summary of discussion

99. Several participants stressed the need for urgent action to arrest environmental degradation caused by development in general and construction in particular. It was noted that construction industry activities were closely linked to the overall economic process. In many instances, therefore, the impact of construction was the result of other socio-economic processes such as urbanization and the rapid growth of population in developing countries. It was, therefore, considered that all sectors should contribute to improving the sustainability of construction.

100. One participant pointed out that the limited resources of developing countries required the setting of priorities in resource allocation. That posed a dialectical problem: environment or development? Another participant, however, felt that development and environment were not incompatible and it was important to reconcile the two needs with a view to ensuring sustainable development. Long-term benefits should not be traded for short-term expediencies as short-term benefits could lead to long-term costs.

101. One participant emphasized the need for introducing environmental impact assessment, especially for large-scale development projects. In that context, he described the positive experiences of impact studies in the mining sector in his country. The Government financed up to 50 per cent of the cost of such studies. It was also stressed that environmental education should be a part of school syllabuses with a view to creating environmental awareness at an early age. Another participant outlined the actions taken by the Government in his country to arrest environmental degradation caused by development activities. These included, apart from public education, the creation of an Environmental Protection Council and awards to designers for environmentally sound building designs. He mentioned that construction clients could play an important role by insisting on the incorporation of environmental considerations at the design stage. Also, public pressure groups could act as watchdogs in ensuring environmentally responsible construction.

102. Some participants noted that the increasing pressure on land was resulting in the loss of forests and disruption of ecosystems with consequent soil erosion, landslides, floods, and loss of lives and livelihood. In many places in sub-Saharan Africa, the problem had assumed critical proportions. Physical disruption was caused by arbitrary siting of quarries, coral mining, sand mining from river beds etc. It was emphasized that developing countries should prepare legislation on land-use planning and on regulating construction activities.

103. Several participants noted that urbanization had caused an increasing shift from the use of local building materials, such as bricks, stones and lime, to energy-intensive materials, such as cement, steel and glass. Construction techniques were also often energy intensive. The construction industry was also a major user of timber, both as a structural material and as a fuel for building materials production. Several suggestions were made for reducing the use of non-renewable resources in construction. One was to promote plantations that could supply timber on a sustainable basis to the construction industry. Species that were less accepted commercially should be promoted in

construction. The use of wooded trusses could reduce timber requirements in construction. Recycling and the use of wastes should also be promoted in the construction sector.

104. Several suggestions were made for improving energy efficiency in construction and in buildings in use. The first prerequisite was knowledge of the energy intensity of different building materials. Energy audits of industries producing building materials were recommended. One participant drew attention to the possibility of achieving significant energy savings through the use of stabilized clay-blocks mixed with cement. A special process allowing for the elimination of the oven and drier could lead to savings of up to 90 per cent. Another participant pointed out that the energy embodied in buildings constituted only 10-15 per cent of total lifetime energy consumption in buildings, the rest being consumed through lighting, heating and cooling.

105. Several suggestions were made concerning ways in which the construction industry could play an important role in reducing energy consumption in buildings. Designers should select materials that were less energy intensive and introduce design features that could minimize energy use in buildings. Decisions should be based on the total life-cycle cost of each project including energy costs. Contractors should maximize the use of recycled materials and the reuse of waste materials. Material manufacturers should improve the energy efficiency of their production process. Governments would have to provide suitable incentives for that purpose. It was stressed that the environmental education of all practitioners in the industry was essential. Professional bodies could play a key role in sensitizing their members to issues concerning the management of resources.

106. Several examples of air pollution caused by the construction industry were mentioned by the participants. Most of them related to the use of energy in construction operations. It was considered that the improvment of energy efficiency could lead to a drastic reduction in the emission of green-house gases. The increased use of locally available building materials could also reduce transportation-related pollution. One participant mentioned the dust pollution caused by cement plants. The use of improved technologies could reduce such pollution considerably. However, it was pointed out that such abatement measures incurred substantial costs, which could be up to 15 per cent of the total investment. Mention was made of a UNDP-funded programme to reduce the pollution caused by cement plants.

107. The participants identified several priority areas for international and technical cooperation. Information exchange was of first importance and an area in which both North-South and South-South cooperation were recommended. It was considered necessary to develop data banks so that developing countries could obtain information on the energy intensity of different materials, the availability and suppliers of clean technologies and environmental impact assessment techniques etc. Several countries mentioned the urgent need to speed up the transfer of clean and energy-efficient technologies as well as technologies for pollution control. The developing countries would need help in upgrading their technologies and introducing effective abatement measures. The participants urged both Habitat and UNIDO to help developing countries in acquiring those technologies. Developing countries should also use GEF to meet the costs of introducing sustainable construction practices.

III. Investment promotion session

Summary of the session

108. The investment promotion session was convened, for the first time, within the framework of a Consultation meeting in order to give substance to the decision of the Industrial Development Board adopted at its ninth plenary meeting held in May 1992.[5] The Board recommended that the Director-General should ensure that Consultations were synergized with other UNIDO activities.

109. One of the main objectives of the session, which was organized by the Industrial Investment Division, was to encourage the setting up of industrial partnerships between promoters and potential partners in addition to facilitating North-South as well as South-South bilateral contacts for business opportunities. A further objective was to identify investment and business opportunities.

110. In opening the session, a representative of the Industrial Investment Division noted the satisfactory experience achieved within the framework of the programme of industrial cooperation in the building materials sector in Africa implemented in 1990. With the assistance of foreign investors and the cooperation of UNDP and UNIDO, the programme had been able to implement investment projects to the benefit of all the parties involved including the local entrepreneurs. Cameroon and Zaire had been among the beneficiaries of technical cooperation and transfer of know-how for the production of bricks, for instance.

111. The programme in Africa had given UNIDO the opportunity of promoting a full package of assistance consisting basically of: (a) conceptualization; (b) identification of the kind of partnerships required (e.g. technical, financial or commercial); (c) pre-investment study; (d) search for sources of financing; (e) commissioning; and (f) training of management and personnel.

112. With a view to strengthening industrial cooperation, he said that the promotional activities in the area of investment would be extended to the transfer of technology and joint ventures. Furthermore, in order to reduce the production costs of building materials, which was a point that had received much attention during a previous Consultation,[6] investment in projects with a low consumption of energy including the utilization of labour would be encouraged.

113. As a result of the efforts of UNIDO, projects as well as business opportunities and potential foreign partners had been identified in such areas as: rehabilitation and modernization of brick and cement factories; transfer of technology in the construction of steel-frame structures; manufacture of panels from red mud, a waste derived from bauxite processing; and transfer of know-how in the production of white cement for rendering and similar applications.

Notes

[5]"Report of the Industrial Development Board on the work of its sixth session, 28 May-1 June 1990" (GC.4/2), annex I, IDB.6/Dec.5.

[2]"Report: Global Preparatory Meeting for the First Consultation on the Construction Industry, Berkeley, California, United States of America, 1-3 December 1992" (IPCT.176 (SPEC)).

[3]"Report: Regional Preparatory Meeting for the First Consultation on the Construction Industry, Damascus, Syrian Arab Republic, 10-11 February 1993" (IPCT.179 (SPEC)).

[4]*Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992* (United Nations publication, Sales No. E.93.I.8), vol. I, annex II.

[5]"Report of the Industrial Development Board on the work of its ninth session, 18-22 May 1992" (GC.5/2), IDB.9/Dec.9, para. (g) (ii) and (iii).

[6]*Report: Second Consultation on the Building Materials Industry, Athens, Greece, 4-8 November 1991* (ID/380).

Annex I

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