OCCASION

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

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNITED NATIONS CENTRE FOR HUMAN SETTLEMENTS (HABITAT)

FIRST CONSULTATION ON THE CONSTRUCTION INDUSTRY

Tunis, Tunisia, 3–7 May 1993

Distr.
LIMITED

ID/WG.528/5
23 March 1993

ORIGINAL: ENGLISH

Issue Paper I*

PROSPECTS FOR DEVELOPMENT OF THE CONSTRUCTION INDUSTRY IN THE DEVELOPING COUNTRIES

Prepared by

the UNIDO Secretariat

*This document has not been edited.

V.93-83185

TABLE OF CONTENTS

I. INTRODUCTION

1. The construction industry is a key sector in realizing economic goals and better living conditions. The industry provides basic human needs including housing and shelter, communications and other amenities such as water supply and sanitation to name a few. Investment in construction is necessary to development programmes, health, education and small-scale rural industrial plants. Additionally, the industry contributes significantly to gross domestic product (GDP), gross fixed capital formation (GFCF) and provides employment opportunities. While the basic input of construction to economic development is its contribution to productive capacity and to the raising of living standards, it also stimulates other economic sectors through backward and forward linkages with, i.e. capital goods and transport.

2. For coherent development of the construction industry major issues have to be addressed relating to, among others, management, financing and the role of the State as well as that of the main actors in the industry. Additionally, other relevant issues stemming from imports, construction costs, building materials inputs, technology and risks have to be taken into account, including the impact of the industry as a whole on the environment.

II. GENERAL CHARACTERISTICS OF THE CONSTRUCTION INDUSTRY

3. Despite the growing interest of the developing countries in developing their construction industry and the high profile of the industry in the national economy of many countries, construction is generally not considered as a clearly identifiable industry. It plays a dynamic role in the process of growth and development. However, it is an industrial sector that is too often ignored by major actors, i.e. economists, planners, administrators and others concerned with development issues.

4. Another characteristic is the number of diverse professional and specialized trades involved in the construction process from programming, planning, financing and designing, to tendering, contracting and building. The contractor in his own capacity as one of the main actors, is only part of the whole process. Furthermore, the institutional mechanisms within which the industry operates, such as suppliers, research institutions, trade and professional associations and government agencies, occupy an important role in the complex pattern of activities that can often be conflicting. The responsibility for production is divided among a wide variety of participants.

5. As building materials account for about 50 per cent of basic inputs to the construction industry, there is a tendency to consider the construction industry and the building materials industry as basically part of the same industry. Due to increasing trends towards industrialization through prefabricating and precasting processes, the boundaries between

the two industries are not well-defined, thus increasing further the complexity for a clear identification of the construction industry as an industry in its own right.

6. Based on these considerations the Consultation should centre its deliberations on the major constraints placed on the construction industry and the search for practical solutions to overcome these constraints which are derived primarily from the fragmented nature of the industry. Some of the basic issues consist of finding viable approaches for coherent integration within the disaggregate structure of the sector, strengthening the linkages and providing the developing countries with a construction industry capable of responding competitively to the demand put upon it.

III. THE CONSTRUCTION INDUSTRY AND THE ECONOMY

7. The construction industry is an integral part of a country's economy and provides facilities through a diversity of engineering works necessary for economic development. The construction of basic infrastructure relating to transport, agriculture and communications is essential to development as is construction of manufacturing facilities. It has been estimated that the construction of civil works, i.e. roads, harbours, dams and water supplies accounts for 30 per cent of the construction market, whilst buildings used for schools, factories, hospitals and housing account for 70 per cent. Governments are usually the clients for most of the civil works and are often responsible for a large part of the building demand. The industry is, therefore, susceptible to government policy. There is no particular institutional strategy in most developing countries that would give the industry its proper place in the overall economic planning process.

8. In terms of value-added, gross domestic fixed capital formation and employment, the contribution of the construction industry as a whole is relevant. The value added in the industrialized countries ranges from between 4 to 8 percent of the gross domestic product whereas in the developing countries this range is between 3 and 11 per cent.[1] Construction also plays a key role in the national economy through multiplier effects on other economic sectors. Its backward and forward linkages with other industrial activities induce growth and promote industrialization; backward linkages representing products and services as inputs to the construction sector and forward linkages being the consumption resulting from construction. These linkages are not consolidated due to the diverse role of the main actors which does not necessarily converge with the scope of promoting the industry in a concerted manner.

---

[1] Transnational Corporation in the Construction and Design Engineering Industry. United Nations Centre on Transnational Cooperation, United Nations, New York 1987.

9. In financial terms, the industry converts investments into physical assets such as industrial plants, multiple-use roads and general infrastructure. This creation of fixed assets to enable economic activities to take place is a key aspect of the industry. In both developed and developing countries, construction usually accounts for over 50 per cent of fixed capital formation. The market for enterprises associated with the construction sector is therefore largely determined by the level of investments. Construction activities may also suggest that they are basically a reflection of the needs of the population rather than being strictly related to growth of the economy. Nevertheless, while the level of construction output required to maintain economic growth is extremely high, indigenous financial resources are usually limited in developing countries.

10. Regarding employment, construction in most countries is a relatively labour-intensive industry and more so in the developing countries. It provides employment in particular for semi-skilled and unskilled workers. On average, the construction sector accounts for about 5 per cent of total employment: 3 per cent in Africa, 4 per cent in Asia and 6 per cent in Latin America.

IV. CONSTRAINTS

4.1 Demand

11. In general the needs for housing and infrastructure works increase with the population growth. The urbanization in most of the major cities in the developing world creates additional demand for infrastructure and social buildings. In the coming years new shelters must be built on a large scale in order to accommodate projected growth by the year 2000 when the total population is expected to exceed six billion, more than two thirds of which will be concentrated in the developing countries. Many other developing countries are confronted with the major problem of providing adequate dwelling and social facilities to their growing population. Nevertheless, a poorly organized local construction industry is not in a position to cope satisfactorily with increasing demand, as generally experienced in many nations in the developing world.

4.2 Fluctuation, risks and planning

12. During periods of economic expansion the construction industry grows at a faster rate than other sectors, whereas during periods of economic stagnation the industry is generally the first one to feel a negative impact due to lack of demand. The fluctuation in the demand, a characteristic of the construction industry, is a major risk factor as a result of which business failures and bankruptcies are often experienced. One of the central issues in the development of the construction industry is the growth of human capacity to manage those risks. In developing countries, statistical coverage is generally neither systematic nor comprehensive. What is usually reported

in statistical abstracts is random data on building permits, imports and production statistics of a few basic building materials, components and occasionally employment in the modern construction sector. In several countries statistical analyses of the construction industry are limited to activities mainly carried out by contracting firms. The lack of information on the industry inhibits planning and forecasting.

4.3 Skills and know-how

13. Due to limited technological development, developing countries have not been in a position to fully exploit their local resources to build up their construction capabilities and face the demand placed upon them; the demand is often beyond the capacity of these countries. A major problem arises when they acquire finance for modern construction, i.e. building or infrastructure; they lack skills, know-how and equipment.[2] The interest of the international community in assisting the developing countries in their development efforts is very apparent in the construction sector. For instance, in 1987 the 250 largest transnational corporations reported large foreign contracts worth US$ 287.7 billion, the foreign component of which was US$ 73.9 billion. It is estimated that four-fifths of the foreign contracts were in developing countries.[3]

4.4 Imports

14. One of the major issues for the developing countries stems from their reliance on foreign firms for the construction of large infrastructural works as well as modern buildings. Machinery, equipment, materials, know-how, expertise and technology have to be imported. These imports create additional strains on hard currency reserves that could otherwise be used for development objectives. The paramount need for these countries is to upgrade their local capabilities so that their construction industry can have a wider share of the local market, participate fully with their foreign counterparts in the development efforts nation-wide and, in the long-term, reduce their dependency on imports.

4.5 Building materials input

15. The small size of the construction market, its fragmentation and dispersal over wide areas, are major impediments to full cost-effectiveness in this sector. Appropriate programming and planning may contribute to reducing excessive costs in an industry which already has the reputation for cost overruns and late completion of works often due to the supply-side constraints. On the other hand, building materials accounting

---

[2] W. Paul Strassman and Jill Wells, "The Global Construction Industry, Strategies for Entry, Growth and Survival; World Industries Studies", 1988.

[3] Transnational corporations. Op.ct.

for nearly 50 per cent of construction costs are selected by professionals primarily due to safety and technical considerations. Consumers as well as professionals in the sector are reluctant to use new, cheaper alternative materials or locally-made import substitutes. Other relevant factors influencing the cost structure are the proximity or remoteness of the supply source of the materials, the energy cost in their production process, the dispersal of the production systems and transportation. Proper planning and concerted action at the design stage between architects and engineers in conjunction with the experience of the contractor could contribute to reducing costs. The contractor, as one of the major actors, has no control over design or selection of materials which directly affect the final cost of execution.

4.6 Financing

16. Financing has been and continues to be a critical constraint to the development of the construction industry. The industry needs working capital for equipment, materials, transport and payment of wages, etc.; the magnitude of funds required is dictated by the nature of the operations. For instance, for the construction of buildings, intensive use of labour and materials is made; equipment costs amount to approximately 15 per cent of overall costs. For labour-intensive civil works, short-term working capital is needed to cover wages and salaries which account for over 50 per cent. Regarding equipment-intensive civil construction, capital costs for equipment may account for up to 60 per cent of overall costs, whereas wages, salaries, materials and equipment, running costs and overheads amount to between 40 and 60 per cent of costs.

17. Apart from limited access to commercial banks, entrepreneurs are faced with an unparalleled financial burden. Unlike other industry owners, an entrepreneur is bound by unfavourable financial conditions: he is paid in instalments long after the delivery of the "product", and needs time for preparing the site and assembling the "nomadic factory". During this time no payments are disbursed to him. Furthermore, his performance bond and defect guarantee may be lost due to low quality work of unskilled or semi-skilled workers.[4]

18. If governments have the major role of raising the necessary funds from domestic and external sources for their priority projects, they also have the responsibility of creating the proper climate, including the conditions conducive to facilitating access of entrepreneurs to specialized financing mechanisms for construction undertakings. Collateral is a major problem faced by many contractors. Access by small and medium firms to credit institutions should be made easier, providing viable plans are put forward for upgrading skills or expanding their operations.

---

[4] T. Tassios, "Structure and Function of the Construction Industry with Emphasis on the Developing Countries", UNIDO, ID/WG.528/1, 8 Sept. 1992.

4.7 Technology

19. In developing countries there are inadequacies in the institutional capacity to adopt advanced construction technologies to the specific requirements of those countries. Innovative approaches have not met expectations due in part to educational or training programmes not being able to produce proper technologists, researchers and technicians. Lack of financing inhibits research. Moreover, collective efforts are not made in the search for appropriate solutions to technological problems in construction in those countries.

20. In industrialized countries technological improvements are expected to continue through the use of innovative architectural and engineering design, better management controls for organizing, monitoring and controlling construction activities, and introduction of more productive equipment and machinery and improved materials. Also, the use of microcomputers and software has started to transform construction industry design, scheduling and management practices. For instance, computer-aided design (CAD) helps shorten the design cycle and increase cost-effectiveness and quality of pre-construction design. In addition, computers improve the quality of project management through the use of management tools such as Critical Path Method (CPM) as well as Program Evaluation and Review Technique (PERT).[5] The majority of developing countries continues to be passive in the process of industrialization of their construction industry.

4.8 Performance and productivity

21. A major concern arises from the slow pace of the industry to the adaptation of new technologies that could increase performance, speed up completion of projects and improve quality. The highly fragmented nature of the industry generates a widely disarticulated project delivery system which creates major road blocks to improving performance. In addition, uneven quality of labour and constraints to technology innovations from government regulations, building codes and lengthy bureaucratic practices are further impediments to improvement. The lack of vertical or horizontal integration in the industry is a result of its fragmented nature, thus also affecting its productivity.[6] Approaches to mass housing techniques through standardization and prefabrication methods have not been viable in many developing countries. Industrialized production methods combined with the necessary innovative design-approach is lacking.

---

[5] D.E. Dowall and L.C. Barone, "Improving Construction Industry Programmes: Issues and Opportunities, UNIDO, ID/WG.528/2, March 1993.

[6] D.E. Dowall, op.ct.

4.9 Extension services

22. Acceptability and durability of construction through quality control and testing are basic components of a strategy aimed at maximizing performance and reducing maintenance costs. The preparation of manuals and specification guidelines would be one of the tools to a common approach to construction techniques and acceptability. Extension services such as technical centres, standardization and quality-control institutes, including research institutions, are instruments geared to assisting the development process of the industry. In building national capacity these services should be integrated in a general policy framework as part of a control mechanism to construction outputs and should operate within an inter-related network with the industry.

V. FINAL CONSIDERATIONS

23. The construction industry is a key growth sector, which on its own can contribute to economic development. In the light of the major constraints hampering the development of the sector, the Consultation should focus on the relevant strategies and policies necessary for sustainable growth. However, innovative approaches are necessary including changes in current policy and institutional framework applicable on a country-to-country basis in the developing world. On account of opportunities offered by North-South and South-South cooperation at regional and international levels, consideration should be given to the following aspects of the industry.

5.1 The role of the State

24. In general, governments have a major role to play in construction activities in any given country through programming and financing of projects, as well as by controlling and enforcing of codes and standards. They influence the construction process as a whole including that of the private sector. Government ministries influencing construction are very diverse, i.e. those of health, education, housing and transport. They sometimes lack coordination in terms of programming and implementing at the national level. Efforts should be made by the State to, inter alia, promote the industry within a general strategy and policy framework including both the public and private sectors. In addition, developing countries have to find ways to accelerate the evolutionary process of development of the industry. This usually implies the establishment of dedicated institutions. Such institutions can yield significant benefits in terms of improved national construction capacity and performance.[7]

---

[7] Derek Miles and Richard Neale, "Building for tomorrow: International Experience in Construction Industry Development", International Labour Office, Geneva, 1991.

5.2 Entrepreneurship

25. The construction industry lends itself well to entrepreneurship opportunities. However, these are not fully exploited due to the lack of policy and support measures conducive to entrepreneurship development. Risks may also inhibit potential entrepreneurs in addition to lack of support in terms of access to credit, support services and information on i.e. markets and technologies. Training is needed in key areas covering management techniques, cost control and scheduling of works.

26. In conclusion, whilst promotional strategy and policies are country-specific, common concerns of many developing countries in their efforts to develop their construction industry may focus on:

(i) Partnership between domestic and foreign firms. However, local consultancy firms have a limited field of operation in addition to sharing limited responsibilities in joint-ventures with their foreign counterparts. Mechanisms to reinforce mastering of expertise and skills to build up competitive capabilities are lacking.

(ii) Maintenance; in the majority of developing countries maintenance is a marginal activity in the construction sector and does not figure in project cost analyses and contracting.

(iii) Increasing the degree of self-reliance and effectiveness of small- and medium-scale construction enterprises. The lack of skills in managing financial resources and cost estimation, inhibits small enterprises from participating satisfactorily in tendering practices. Poor construction management capabilities limit contracting opportunities including sub-contracting. In a general strategy for promotion, policies should be tailored to improve access to work by small enterprises and assist them through training and technical advice. The creation of a national association of contractors would be beneficial to its members and to clients. One role of the association would be to carry on a dialogue with governments on key issues affecting the industry.[8]

(iv) The intensification of efforts to promote a competitive construction industry in the developing countries through international, regional and subregional cooperation. Interaction between existing cooperation mechanisms in industrialized and developing countries, as well as between developing countries themselves must be encouraged, particularly among countries with geographic similarities within regions in Africa, Asia and Latin America.

---

[8] International Labour Office, "Guidelines for the Development of Small-Scale Construction Enterprises", Geneva, 1987.

(v) Environmental issues relating to the construction industry including the depletion of non-renewable resources and the exploitation of natural materials for construction purposes. Developing countries have shown only a modest interest in recycling of waste and by-products as alternative inputs to constructions which could reduce demand on natural resources. Pollution caused by the manufacturing of construction materials i.e. cement, iron, steel and aluminum is a major concern world-wide. Environmental issues and pollution are the subject of detailed consideration in Issue Paper II developed by HABITAT.