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Issues and Strategies in Developing Countries
The Construction Industry

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THE WORLD BANK
Washington, D.C.
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The Construction Industry

Issues and Strategies in Developing Countries
Summary

The construction industry is an essential contributor to the process of development. Roads, dams, irrigation works, schools, houses, hospitals, factories, and other construction works are the physical foundations on which development efforts and improved living standards are established. About one-half of the gross, fixed capital formation normally takes the form of construction output. Some 44 percent of the total cost of projects approved for assistance by the World Bank and its affiliate, the International Development Association, in the three-year period fiscal 1980–82 goes for construction work. The construction industry usually accounts for between 3 percent and 8 percent of a developing country’s gross domestic product (GDP); the more dynamic national economies as well as wealthier countries are largely bunched at the upper end of this range.

Improving construction capacity and capability is important to most developing countries. First, the extensive basic infrastructures built up at high cost in earlier years, and especially during the 1960s and 1970s, have now to be maintained; and it is generally expensive, if not impossible, to bring foreign contractors back again for this type of work. Second, much of the continuing new investment is in small works that are scattered, which are also usually unsuited for execution by foreign firms. Third, there is a need to improve on the efficiency, timeliness, and quality of construction and maintenance work in many developing countries. And, fourth, there is a growing recognition that construction can be a more important generator of jobs and a source of managers and businessmen than it has often been in the past.

The growing interest of many countries in developing their construction industry has coincided with increasing concern of the Bank for this sector. In 1973, after various studies, the Bank first adopted an explicit policy of assistance to promote the growth of borrowing countries' construction industries. Since then, initiatives have been taken in a variety of projects in over 40 countries. Several of these initiatives taken have been within the last two or three years.

The primary purpose of this paper is to suggest directions and emphases for future actions by the Bank to promote the development of the domestic construction industry in developing countries. The report is heavily based on the Bank’s experience over ten years. It aims to draw the attention of the widest possible readership to the problems of developing the construction industry as well as to the opportunities that exist to improve the efficiency of this important sector of the economy.
The construction sector has two main classes of product. One is building which is associated with housing, offices, hospitals, factories, and so forth; the other is civil works involving the infrastructure for water supply, transport, irrigation, power generation, and so on. Typically, building tends to account for around 70 percent of the construction market in both developing as well as developed countries; civil works takes up the rest. Governments usually are the clients for most of the latter and often have direct or indirect control over a large part of the building demand.

Another important distinction made is on the types of production units used in the industry: in developing countries, these include small jobbers and builders of the "informal" sector who are principally concerned with building and improving single-family shelter; communal and self-help organizations that apply traditional or labor-intensive techniques in both building and civil engineering construction; state-owned organizations; and domestic private contractors. The last two categories generally account for the bulk of the work carried out in the formal sector; however, foreign construction enterprises do up to 80 percent of the construction work in the formal sector in a few least-developed countries.

Informal, self-help building work is the predominant construction activity in poorer countries, catering for essential shelter and related requirements which would otherwise go unattended. The informal construction activities, relying heavily on self-employed and family labor, are small enough to escape most legal regulation. Because they largely elude statistical enumeration, there is a dearth of information on the basis of which meaningful assistance plans could be drawn. As a consequence, this part of construction activity tends to receive less attention from governments than that dedicated to formal construction projects.

Construction work also involves grave risks—more so when compared to other types of economic activity. Unlike the typical manufacturer or farmer, the construction entrepreneur moves from site to site, organizes the logistics for timely assembly of all the inputs there, and follows a custom design for each site. Jobs are usually won by means of specific bids. Costs, therefore, have to be estimated for each site, with assumptions made about many variables such as site conditions, weather, productivity of labor and equipment, the time required for delivery of inputs, and so forth. For civil works, the risks involved in bidding exceed even those for building because the scale of work is usually larger, the use of heavy equipment is greater, and the sensitivity to the effects of inclement weather and, in some instances, remoteness from service and supply centers far more pervasive.

Since the majority of construction industry output is capital investment, demand tends to fluctuate considerably more than for most other industries.
The contractor, thus, has to face the risk of sharp fluctuations in his volume of work and, hence, in the number of employees and amount of equipment he needs. Again, the risks tend to be greater and the fluctuations more marked for civil works than for building.

The central issue in the development of a country’s construction industry is the growth of human capacity to manage these risks. The management task is often more difficult in developing countries because of shortage of resources and inadequacies of other systems on which construction relies. Nevertheless, the capacity to manage building construction generally develops and expands fairly naturally, sustained by a relatively steady demand. The risks involved in small- and medium-scale building construction work can usually be understood and evaluated by unsophisticated managers. Civil works, on the other hand, require managers who are capable of evaluating and handling a wider, complex array of risks. The necessary managerial and technical ability is generally developed with much greater difficulty and is usually in short supply.

The most common form of state participation in construction is force account operation in which a government department administers services directly to achieve construction or maintenance goals. Force account units have several essential functions; they attend to emergencies, undertake works that do not attract competitive contracting, and carry out routine maintenance. Force account operations are also an important source of trained manpower for the industry at large. However, as a consequence of performing a useful training function, they lose their better personnel to better paid positions in the private sector. Consequently, government departments tend to suffer from a constant shortage of personnel with higher skills, both for management and for field operations. Perhaps, the biggest management shortcoming of force account operations is the absence of accountability for the use of resources measured in units of production.

The enterprise part of the industry—and especially the private sector—is often subjected to excessive and unnecessary risks which are not conducive to the growth of a sound management capacity. Procurement and contracting procedures often fail to ensure a fair, competitive business practice. Contracts are often one-sided, expressing the rights of the owner and the obligations of the contractor, without compensation to the latter for default by the owner. Such procedures, as a rule, lead to delayed payments and fail to compensate the contractor for escalation in costs and for delay in obtaining the site of works. Contract difficulties, cost and time overruns, can frequently be traced to such problems. Contract documents often are also excessively complex for the job to be done and sometimes inhibit
participation in tenders by domestic contractors. Inexperienced and excessively rigid contract supervision often further adds to the problems.

The managers of construction companies generally give inadequate attention to the training of staff, especially in management, which is essential to permit greater delegation of responsibilities in support of further growth of the company. Owner-managers normally come from other businesses or from the ranks of talented professionals and artisans. They outgrow their capacity to evaluate and manage risk, particularly in periods of rapid expansion which normally characterize the construction industry during upswings of the economy. They also tend to neglect the need for a strong association to protect and advance the interests of the industry.

Joint ventures and subcontracting arrangements between foreign and domestic firms, while sometimes useful, have not generally proven successful in the transmission of managerial know-how, except in cases where the local partner had a sound management background. Domestic firms are often seen as partners of necessity and relegated to technical and public relations work. Subcontractors tend to receive special help only when they are the sole supplier of a particular good or service in the market and, therefore, must be cultivated.

Construction work in many developing countries also suffers from administrative and allocative inefficiencies. Because of a lack of a sound framework of institutional and legal arrangements, especially those affecting public sector procurement, the industry is not shaped to respond quickly and efficiently to the needs of the clients. Works tend to take far longer than expected and not infrequently construction standards are skimmed. At the same time, distortions in prices and the rationing of materials, fuels, and other inputs tend to cause allocative inefficiencies which make the works in hand economically more costly than they should be. Overvalued local currency, artificially low import tariffs on equipment, and legal minimum wages in excess of market prices often combine to make construction techniques less labor-intensive than they should be. Although decreasingly so, government officials often remain reluctant to apply appropriate technology: it has been considered retrograde and it does not convey the kudos and sense of power that is frequently associated with the operation of heavy equipment.

In most developing countries, the inadequate growth of construction capacity—particularly the capacity to manage construction—is a problem that public and private sectors need to face. The government and public sector agencies have a double responsibility as principal client as well as creator of the broader business framework. Poor economic planning and
weak budgetary procedures frequently have tended to exacerbate fluctuations in the demand for construction and hinder the development of domestic capacity. Fiscal and labor legislation, which is ill-adapted to the needs of the industry, and poor arrangements for channelling the required foreign exchange for purchase of spare parts, also severely affect the construction industry.

In seeking to develop domestic construction industries in member countries, the approach in most early initiatives has been one of dealing with discrete problems, through interventions that were limited in scope and not linked to a series of actions within a comprehensive strategy. These interventions have taken the shape of studies which did not result in recommendations for specific action, or were not followed up through lack of commitment by the government. They also included technical or financial assistance that were not reinforced with continuity of work or improved administrative practices.

Other more successful interventions have been the "slicing and packaging" of larger construction projects which has resulted in added work opportunities for domestic contractors, the development of personnel resources, and the introduction or improvement of labor-intensive civil construction technology. Nevertheless, these actions have also been limited in scope and time and have not formed part of a wider strategy.

Some lessons can be learned from these experiences. First, the government needs to be committed to develop the industry, adopt measures that are needed to solve specific problems and constraints, and introduce reforms in policy and procedure to improve the business environment of the industry. Second, the inputs of specialized technical assistance required need to be more comprehensive and apply not only to construction enterprises, but also to administrators and supervisors of government projects and to the banks that provide financial support to the industry. Third, considerable effort is required, over a protracted period, to achieve the required results, particularly in the civil engineering part of the industry. Fourth, and most important, a comprehensive strategy is required to support the construction sector to integrate efforts channelled through the various sectors which make use of, or contribute to, construction activities.

The strategy must address the general policy environment in which the industry operates as well as specific problems faced by the sector in each country. To implement the strategy, a small number of well-focused action plans should be drawn up to solve the more pressing problems. Concurrently, work should start on the long-term reforms which are often necessary to improve the policy environment.
Making the construction industry competitive should be set as an important objective of government's development policy. The industry should also be taken into account in the planning process, which should help in determining its capacity and needs and in dampening the peaks and troughs of construction demand. Other points that need to be borne in mind when considering the institutional and policy environment of the industry include:

- The assignment of responsibility to a government office for promoting the development of the construction industry.
- The introduction of reforms which may be necessary in such areas as monetary policies and interest rates; budgeting regulations which permit multi-year contracts and allow continuity of cashflows for them; improved contracting and contract administration procedures to provide fair and competitive procurement practices, equitable conditions of contract, and supportive supervision; wage and employment policies which encourage the wider use of underemployed or unemployed labor; and procedures for allocating foreign exchange required by the industry, particularly for importing spare parts.
- The introduction of education policies which include the requirements of the construction industry, especially for training managers and skilled personnel.
- The recasting of publicly owned construction organizations into competitive enterprises through the introduction of commercial management practices and accountability.

The specific public interventions that are necessary can be applied in the planning and execution of construction and maintenance work in all sectors, or can constitute particular action plans. The measures that can be taken in procurement and contracting include:

- The introduction of fair procedures for competitive bidding for construction work.
- The setting of equitable conditions of contract which should include compensation for delays in payments.
- The streamlining of customs and importation procedures to facilitate the acquisition of equipment, spare parts, and materials.

In addition, the formation of a representative institution within the industry should be pursued.

The problems that must be addressed through specific action plans are largely human and relate particularly to management. In the more developed construction industries, it is the general management ability of entrepreneurs
and managers that usually needs to be improved. These managers are, as a rule, technically well qualified and quite capable of assessing construction risk, so training in peer groups and on-the-job coaching in management should prove useful. In less developed construction industries, the approach required is one of gradual coaching to enhance the capacity of construction entrepreneurs to evaluate and manage increasingly higher levels of risk.

In public sector organizations, commercial practice and accountability can also be introduced by on-the-job coaching. In the past, this has been done by consultants working with the public enterprise. Promising new approaches are being implemented; these include coaching by experienced personnel from international contracting organizations and providing of incentives to the trainer based on the productivity of the "trainee" organization.

Other problems of the construction industry concerning skilled personnel, equipment, and materials shortages can usually be addressed, but in the absence of adequate management and continuity of work opportunities, their effects will be short-lived.

In labor-abundant and capital-scarce economies, increased emphasis should be given to the use of appropriate construction technology. Projects that are small in scale and use low-technology construction—these include, for instance, rural roads, irrigation and flood control works, and schools—should be able to use labor at wages that will make labor-intensive construction cost-effective; and, whenever possible, local materials, and local practices. Designs should be adapted to suit the construction technology appropriate to the region. Efforts should also be made to remove distortions in prices that affect the use of these technologies, or to mitigate the effect of those distortions—for instance, by encouraging contributions of at least part of the inputs (such as labor and materials) by local communities.

In some countries, the nature and complexity of the problems of the industry and its business environment may warrant the drafting of a concise document that outlines the strategy that needs to be followed, the reforms in policies and procedures to be sought, and the specific measures that ought to be introduced in support of the industry. In these cases, a strategy statement would be a most valuable management tool.

Finally, one important point must be stressed: the strategies for developing the domestic construction industry will require concerted actions by a number of sectors and need to be sustained over long periods. They may also call for the implementation of difficult policy reforms. The strategies will only succeed if the government is committed to them and is willing to sustain the actions and implement the reforms that are needed.
1

Introduction

There are limits to the rate at which a country can fruitfully step up its capital formation. Of these, the two most important limits (given finance, suitable natural resources and appropriate institutions) are shortage of skill and inadequacy of public utilities.

Shortage of skill not only prevents people from using capital fruitfully, but may prevent them from using it at all. More than half of capital formation consists of work in construction. Hence the expansion of capital is a function of the rate at which the construction industry can be expanded. Plans cannot be executed if there are not the carpenters, the masons, the electricians and the engineers to do the necessary construction, whether it be of roads, bridges, dams, factories, power plants, houses or the rest.


Recent statistics show that the gross value of construction still constitutes over one-half of the gross fixed investment in most developing countries (see the last column in Table 1 on pages 16 and 17). In developing countries, construction usually accounts for between 3 percent and 8 percent of the gross domestic product (GDP). There are considerable variations, however. In some low-income countries (Burma, Nepal, and Uganda, for example), the share of the construction industry’s “formal sector” in GDP is less than 3 percent; in others that have recently experienced dynamic growth (such as Algeria, Libya, and Yugoslavia), it exceeds 8 percent.

In general, construction activities tend to increase with the increase of a country’s resource base and level off only after a high degree of economic development has been achieved. Among countries that are members of the Organisation for Economic Co-operation and Development, the average share of construction during the 1970s ranged between 7 percent and 8 percent of the GDP. Likewise, a recent study showed that construction labor averaged 7.4 percent of the total labor force of 16 developed countries,
Table 1. Contribution of Manufacturing and Construction to GDP in Selected Countries, 1970–80

<table>
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<tr>
<th>Country</th>
<th>GNP per capita (U.S. dollars)</th>
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<th>Construction value added/GDP (percent)</th>
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(Table continues on the following page.)
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*Note: Reference years are in parentheses.*

— Data not available.

GDFCF: Gross domestic fixed capital formation for 1978.
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contrasting with the average of 3.2 percent in 12 lower-income countries. In the same sample of countries, relative productivity of the construction labor force (measured by the contribution of the construction industry to the gross value of GDP) averaged about $22,500 per capita in richer countries, tailing down to an average of about $2,600 per capita in the poorer countries (see Table 2). The figures are for the latest year of record and are compared in 1980 dollars.

The very significance of construction as a factor of development, however, can turn it into an impediment to progress. This is particularly so in smaller and poorer countries which do not have any domestic construction capability or, at best, have only a rudimentary construction industry. The small scale of infrastructure projects and maintenance work in such countries makes them unattractive to international contracting enterprises. As a result, the procurement of foreign construction services is very difficult or excessively costly. A somewhat similar problem arises in a larger number of countries which, having developed their basic infrastructure, need to develop secondary systems, or renew their assets, as well as maintain the works constructed; in these countries sufficient domestic construction capability is lacking.

The importance of establishing or improving domestic construction industries in developing countries is illustrated too by the fact that as much as 75 percent of the construction work included in Bank projects approved during fiscal years 1980–82 was expected to be carried out either by domestic contractors or by force account.1

The development process, obviously, is not simple; construction is connected with many sectors, for inputs and outputs, and it is important that the development of domestic capabilities be carried out by way of a coordinated and comprehensive approach, starting from the process of planning for economic development. Also, a widespread predisposition against contractors needs to be overcome. Contractors have traditionally been held solely responsible for cost and time overruns, or for introducing irregular practices into the processes of procurement and contract management. No doubt, they share in that responsibility; however, the causes can often be traced to defective contract conditions and poor administration of contracts by the employing authorities. Domestic contractors, like other businesses in developing countries, need to be provided assistance and construction should be recognized as an industry.

1. "Domestic contractors" are defined as being 50 percent or more nationally owned. "Local contractors" are locally based firms, regardless of ownership. A "force account" operation is one in which a government department administers services directly to achieve construction or maintenance goals. The World Bank's fiscal year (FY) runs from July 1 to June 30.
The World Bank's Involvement in Construction

Construction work, on the average, amounted to 44 percent of the $11.4 billion per year in projects supported by the Bank during the period fiscal 1980–82. If the same proportion is maintained, construction expenditure should account for some $70 billion of loan commitments during the period fiscal 1982–86. A much larger additional demand will arise from private and public investment financed from other sources.2

During the 1950s and 1960s, the bulk of Bank-financed investment went to large, capital-intensive infrastructure projects, such as dams, power stations, highways, and ports. Attention was focused mainly on the successful execution of the end-product at low cost and its subsequent efficient operation. Because the construction capacity of domestic contractors was limited, these works were often carried out by foreign contractors; this was so even in countries that have now reached middle-income or semi-industrialized status, such as Brazil and the Republic of Korea.

The Bank still is very much concerned with such major works as hydroelectric power stations and ports. But in more recent years, greater importance has been given to the processes by which the end-product is achieved and subsequently maintained. These involve fundamental issues of economic development which significantly affect the opportunities for, and pressures on, domestic construction industries, such as stimulating entrepreneurship, involving local people in institution building, and maintaining the existing infrastructure. In addition, changes in the patterns of the Bank's lending in favor of rural development, population, education, and urban projects have created opportunities for smaller construction works. These smaller works often are unattractive to international contractors; their implementation, therefore, can depend on the existence or the development of a domestic construction industry.

The Bank's early involvement in the development of domestic construction industries came primarily through the "slicing and packaging" of larger jobs to make them accessible to smaller domestic contractors in competition with larger international enterprises;3 Also, some purchases of equipment by domestic contractors were financed from loans made through development finance companies (DFCs). The building materials industry also got help in its expansion from the Bank, and artisans and equipment operators were trained under many education and highway projects.

---

2. A billion is $1,000 million.

3. "Slicing and packaging" consists of subdividing a given set of construction works into smaller contracts, or "slices," and allowing contractors to bid for individual slices or groups of them ("packages").
Table 2. Construction Industry Labor Force and Industry’s Contribution to GDP

<table>
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<tr>
<th>Country</th>
<th>GNP per capita 1980 (U.S. dollars)</th>
<th>Number of total labor force 1980 (thousands)</th>
<th>As percentage of total labor force</th>
<th>U.S. dollars of reference year 1980 (B)</th>
<th>U.S. dollars for columns (B)-(D)</th>
<th>Reference year for columns (F)</th>
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Average of 13 countries: 7.7, 5,490

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</table>

Average of 12 countries: 3.2, 2,609


b. The labor force figures for India are estimates.

Table 3. The World Bank's Participation in Promoting Domestic Construction Industries

<table>
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<tr>
<th>Type of participation</th>
<th>Industrial development and finance</th>
<th>Urban development</th>
<th>Water supply</th>
<th>Education</th>
<th>Technical assistance</th>
<th>Sector work</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study or review</td>
<td>Algeria, Bangladesh, Burma, Cameroon, Colombia, Ecuador, Ghana, Haiti, Honduras, India, Indonesia, Jamaica, Kenya, Liberia, Malawi, Nepal, Niger, Nigeria, Paraguay, Peru, Papua New Guinea, Senegal, Sierra Leone, Sri Lanka, Tanzania, Upper Volta</td>
<td>Burundi, Egypt, Liberia, Madagascar, (Nigeria), Rwanda, Sudan, Swaziland, Yemen A.R.</td>
<td>India, Malawi, Philippines, Zambia</td>
<td>Bangladesh, (Sri Lanka), Jordan, (Indonesia)</td>
<td>Libya, Kuwait</td>
<td>Ethiopia, (Kenia), Rep. of Korea, Islamic Rep. of Iran, Syria, Trinidad and Tobago, Yemen P.D.R.</td>
<td>Pakistan</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Technical assistance</th>
<th>Algeria, Bangladesh, Cameroon, Colombia, Ethiopia, Ghana, Jamaica, Liberia, Nepal, Paraguay, Yemen P.D.R., Papua New Guinea</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial assistance</td>
<td>Ethiopia, Ghana, Nepal, Pakistan</td>
<td>Cameroon, Cyprus, Egypt, (Ghana), Korea, Liberia, Morocco, Philippines</td>
</tr>
<tr>
<td>Construction industry projects</td>
<td>Burma, Indonesia, Sierra Leone</td>
<td>Burundi</td>
</tr>
</tbody>
</table>

*Education projects:* Training in construction skills has been supported by Bank-financed education projects. Between 1966 and 1981, 96 education projects in 60 countries included training components for construction industry personnel, including carpenters, masons, metal workers, electricians, plumbers, and road building construction supervisors.

*Countries in which labor-intensive construction work has been promoted by specific action:* Benin, China, Honduras, Kenya, Lesotho, Malawi, and Philippines.

*Note:* This table does not record actions taken through “slicing and packaging” nor bids with the 7.5 percent local preference. Countries listed in parentheses indicate collaboration between Bank departments.
The Bank’s interest in strengthening domestic construction industry began in 1970 when a staff team visiting Pakistan to “supervise” a highway project proposed a multisectoral approach to construction. This was followed in 1971 by a landmark report on international competitive bidding (ICB) for civil works in India, which included an analysis of the domestic construction industry. The report was followed up by a research project on construction industries.4

In 1973, the Bank’s Board of Executive Directors set a framework for evaluating and assisting individual cases of domestic construction industries in developing countries. The Board approved the proposal to provide a 7.5 percent nominal preference in ICB to domestic contractors in countries with low per capita incomes and authorized the Bank to provide technical and financial assistance for the promotion of efficient domestic construction industries.5 This mandate formed the basis for Bank action in this sector from 1974 onward.

While the direct effects of the preference for domestic contractors have been limited, an increasing number and variety of initiatives in technical and financial assistance to the industry have been taken over the last ten years. Table 3 lists the Bank’s initiatives undertaken in various member countries since 1973 in support of the construction industry.

Highway projects have been the most important vehicle chosen for rendering assistance in a large number of countries, so much so that it is now rare not to include at least a brief assessment of the capacity of the domestic construction industry while appraising a highway project. Such assessments have been made in preparation for, or during execution of, highway projects in 28 countries. In about half of these cases, follow-up technical assistance has been provided directly to contractors, to DFCs lending to them, or to ministries supervising their work. In several loans for highways, provisions have been made for training of contractors and highway department staff and for studies on making greater use of local materials in road building and maintenance.

The Bank’s financial assistance to the construction industry has taken many forms: on-lending through a DFC for equipment purchases (as in Ethiopia, Ghana, and Pakistan); provisions for governments to purchase selected pieces of equipment to rent them to small, local labor contractors (as in Bangladesh, India, and Nepal); provision of equipment and technical assistance to state-owned construction corporations (as in Algeria, Burma,


5. For fiscal 1984, the upper limit for the preference is $410 in 1982 dollars.
and the People’s Democratic Republic of Yemen); and financing of major pilot projects in labor-intensive construction and maintenance (as in Benin, Dominican Republic, Honduras, Kenya, Lesotho, and Malawi). In Sri Lanka, the Bank financed a project to train local construction personnel. A similar project was approved for Indonesia in 1983.

Funds from the Bank have long been channelled by DFCs to producers of building materials, manufacturing enterprises, and occasionally to contracting organizations. Such financing has been especially significant in the Republic of Korea and the Philippines. In Eastern Africa and in the Europe, Middle East, and North Africa regions, special studies have been carried out jointly by the World Bank and the United Nations Industrial Development Organization (UNIDO) to determine the potential for development of the construction industry in eight countries. One project in Rwanda was specifically oriented toward the construction industry, although the government subsequently decided not to proceed with it.

By contrast, the government of Burundi has given a high priority to the development of the country’s nascent construction industry. A special project is now being implemented, aimed at correcting fundamental deficiencies, to ease the development of the building sector as a first step in the formation of a wider-reaching industry. The components of this project include the development and improvement of local construction materials (by introducing or improving, for example, lime kilns, brickmaking, and afforestation); technical assistance to government departments to improve building regulations, contracting and supervising methods, and staffing; technical and financial assistance to contractors; and training of tradesmen.

An important development in the last few years has been the financing of leasing companies by the International Finance Corporation (IFC). Most of these companies have been devoting part of their resources to equipment for construction enterprises. These account for a substantial share of the business of leasing companies established with IFC support in Colombia, the Republic of Korea, the Philippines, Sri Lanka, Thailand, and Uruguay. In Turkey, the IFC is helping establish a guarantee facility for bonding domestic contractors for their export work.

A large number of education projects supported by the Bank have included components for training of artisans and middle-level building technicians. While emphasis has changed lately toward supporting primary education, nevertheless, there continue to be some projects that seek, in part, to train personnel in the construction industry. For example, in Sri Lanka and Indonesia, special construction industry projects are basically addressed at training personnel, and are being carried out in close cooperation between the Education and Highways Departments. Another important initiative has
been the formation of training production units (TPUs) which, although primarily aimed at training the maintenance personnel of government ministries, have contributed to the supply of trained equipment operators and mechanics for the construction industry at large. TPUs are now operating, for example, in Brazil, the Dominican Republic, Kenya, Nigeria, and Zaire.

In urban development, loans have included assistance for the informal building sector; this includes training artisans and small local entrepreneurs (as in Botswana, Mali, Thailand, and Zambia) and financing projects that provide surveyed and properly documented sites, equipped with basic services, to self-help builders. This approach has been used in many urban projects in all regions; for example, the sites-and-services components of development projects for the cities of El Salvador and Mexico, and in Madras, Manila, and Nairobi. Other measures include the provision for special studies of the construction industry in the Philippines and Kenya; vocational training components for building trades skills in Indonesia, Jordan, the Philippines and elsewhere; the development of local construction materials in Guatemala and Tanzania; and the hiring out of building equipment to small builders in the Philippines by the Manila urban development project.

Layout of the Paper

This paper suggests strategies for future action in developing countries. The goal is to improve and advance the growth of the construction industry in developing countries. Particular emphasis is placed on the poorer countries—not only because the industry here faces the most obstacles, but also because these countries are becoming more aware of the contribution being made to development by the process of building and civil construction, and by the creation of jobs and skills. The key role of skills in the growth of the industry is brought out in the chapters dedicated to management and personnel development. Highlighted also are the experiences in labor-intensive construction of civil works in countries with little tradition in the use of these techniques.

However, adequate treatment of the informal sector of construction, which accounts for a large proportion of house building in the poorest countries, is severely hampered by lack of systematized information. Nevertheless, its main characteristics are recognized and the experience of aid agencies which have attempted to assist its development is briefly reviewed and discussed.

The text follows an analytical pattern, touching first on the structure of the construction industry (chapter 2) and its economic background (chapter
3); it then discusses government as a key factor in the generation of demand and as a regulator of supply (chapter 4). In chapters 5 to 8, the factors of production (management, personnel, financial and physical resources) are discussed. Finally, in chapter 9, an overall assessment of Bank initiatives to date and possible future support of domestic construction industries are discussed.
The Structure of the Construction Industry

The structure and organization of the construction industry varies considerably among countries. The differences within the industry are determined by the relative importance of a few specific conditioning factors and special characteristics of the industry as well as by the degree of development of a country's economy.

The structure of the industry is shaped by three main factors:

- **Nature of the work to be done**, which, in turn, is a function of factors of scale, geographic dispersion, function, and specialization (building or civil engineering construction, for example).

- **The choice of technology**, which depends on the industry's state of technological development, the relative abundance or scarcity of labor and capital (and prices for them), climatic and physical conditions, government policies, and the overall development level of the economy.

- **Social and economic environment**, which is conditioned by the general structure and state of the economy, political organization, and the traditions affecting the manner in which business is carried out.

The patterns of organization of production units within the domestic industry are the consequence of the structural determinants outlined above. Usually, these production units fall into four main groups: (a) jobbers and builders in the informal sector; (b) communal or self-help organizations; (c) state-owned organizations or enterprises; and (d) private companies. The three latter groups constitute the domestic construction industry proper (or what is referred to as the "formal sector"), which either competes with or complements a fifth group, foreign contracting organizations.

Participation by foreign contractors in the formal sector of construction is very large in some countries. For example, foreign companies carried out about 95 percent of the work contracted out in Benin in 1976 and about 70 percent in Niger and Burundi in 1979. In Trinidad and Tobago (1978), they carried out almost 50 percent of the work, while in Syria (1976), foreign

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6. Building construction usually includes housing, factory shells, office buildings, schools, hospitals, barracks, and farm buildings. Civil engineering construction includes highways, water supply, power generation and irrigation structures, airports, railways, ports, and the like.
participation accounted for 40 percent of the recorded volume of construction. As countries develop, international contractors find it progressively more difficult to compete with domestic firms, as these become stronger, first in building construction, and at later stages in tasks of increasing complexity, such as roads, airstrips, canals, small dams, and so on. In the more advanced developing countries, foreign contractors now supply only highly specialized services, or work on schemes which exceed the capacity of the domestic companies.

A study of statistical information from 19 countries indicates a distribution ratio of close to 70:30 between building and civil engineering construction respectively (see Table 4). In some of the less developed countries, where the informal sector plays an important role in housing construction, building activities may account for an even larger share of the total construction output. Unfortunately, the official statistics do not include the work of the informal sector, nor do they indicate differences among countries at different stages of development. For instance, for the period 1972–79, the ratio of building and civil engineering construction was similar in Thailand and the United States (about 73:27).

However, year-to-year fluctuation between the two types of construction was considerably more marked in developing countries. Building construction in Thailand varied between 62 percent and 85 percent compared with 68 percent and 75 percent in the United States. Such fluctuations suggest the advantage for contractors in developing countries to diversify by carrying out both civil and building construction.

**The Informal Sector**

In the most basic of construction activities, man fashions a shelter for the use of his family or, in association with neighbors, builds structures to satisfy common needs (for example, flood protection works or access stairways in hillside slums). Individual jobbers and builders, often itinerant, can assist these local efforts by providing specialized skills. Many of these activities rely heavily on self-employed and family labor and are small enough to escape most legal regulation and statistical enumeration.7

Nevertheless, informal construction activities are predominant in poorer countries and cater to essential requirements of society that would otherwise go unattended. It is also a labor-intensive activity and a seedbed of skills and

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7. The U.N. definition of the construction industry for statistical purposes, for example, excludes the informal sector.
potential entrepreneurs for the formal sector. Because of these factors, relatively modest assistance offered to this sector can produce results of significant impact. The assistance can take the form of technical advice and training in basic skills, making available basic house-building sites and services (including legal rights to the land), and fostering the establishment of mechanisms for the supply of materials at competitive prices.

Organized Community Construction

In many parts of the world, construction and maintenance of infrastructure works has traditionally been done through organized communal effort. In India and China, the tradition has continued uninterrupted for many centuries. Elsewhere, in developing and developed countries alike, the strong communal systems of the past have fallen into neglect. Such was the case of the "minka" or "minga" of the western coast of South America (mainly in Ecuador, Peru, and Bolivia). This system of communal organization for construction dating back to Inca times was largely dormant during the colonial and early independence periods. It is now being revitalized as part of the overall drive for development in the areas concerned.

In other countries, the commutation of taxes with labor services in colonial times was used to encourage construction of public works such as roads; one striking example was the Ugandan "luwalo," which, together with a tribal tradition for road building, accounted largely for Uganda's reputation for having one of the best road systems in sub-Saharan Africa until the 1960s. Work-for-taxes systems produced important results, not only in old colonies, but also in the more advanced countries during their early stages of development. However, these forms of organization are considered regressive today and, therefore, have fallen into disuse.

In developing countries that do not have a modern tradition for organized community construction, efforts are being made (in some cases with Bank assistance) to introduce the system gradually. Communal work is another instance where moderate use of financial and technical assistance, similar to those for the informal sector, can achieve good results. A good example is in Malawi, where small projects such as wells, schools, health clinics, and houses for teachers and health workers are constructed through self-help, with central government assistance channelled through local development committees. One self-help scheme to supply piped water has operated since 1968. By March 1982, 3,000 kilometers of pipeline and 4,160 village taps had been installed, serving some 640,000 people.
### Table 4. Relative Value of Building and Civil Engineering Construction Work, 1972–79

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<td>44</td>
<td>75</td>
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<tr>
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<td>24</td>
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<td>22</td>
<td>78</td>
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<td>75</td>
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<tr>
<td>Japan</td>
<td>1,650</td>
<td>67</td>
<td>33</td>
<td>70</td>
<td>30</td>
<td>71</td>
<td>29</td>
<td>71</td>
<td>29</td>
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<td>20</td>
<td>79</td>
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<td>24</td>
<td>71</td>
<td>29</td>
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<tr>
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<td>72</td>
<td>28</td>
<td>71</td>
<td>29</td>
<td>70</td>
<td>30</td>
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<td>Thailand</td>
<td>600</td>
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<td>75</td>
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<td>61</td>
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<tr>
<td>Sri Lanka</td>
<td>230</td>
<td>86</td>
<td>14</td>
<td>89</td>
<td>13</td>
<td>72</td>
<td>28</td>
<td>69</td>
<td>31</td>
<td>73</td>
</tr>
<tr>
<td>Malawi</td>
<td>220</td>
<td>57</td>
<td>43</td>
<td>71</td>
<td>29</td>
<td>75</td>
<td>25</td>
<td>74</td>
<td>26</td>
<td>77</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>120</td>
<td>59</td>
<td>41</td>
<td>73</td>
<td>27</td>
<td>78</td>
<td>22</td>
<td>78</td>
<td>22</td>
<td>65</td>
</tr>
</tbody>
</table>

**Note:** B. Building construction as percentage of total construction.

CE. Civil engineering construction as percentage of total construction.

—. Data not available.

Construction by Public Sector Agencies or Enterprises

State-owned construction organizations are established for various purposes. In countries where there is a good supply of competitive contractors, the public sector usually takes charge of construction, repair, maintenance, and emergency work which generally are unattractive to contractors. In countries that present unusual mobilization problems or risks, which inhibit the presence of international contractors or make their services too costly, state-owned enterprises can fill this void. In yet other cases, governments may try to start up a domestic construction industry by creating a public organization to act as a seedbed for developing construction skills or supporting incipient domestic companies.

Government departments throughout the world employ their own forces to carry out construction and maintenance work required for their operations; this is normally referred to as force account work. In the developing countries, in particular, this form of organization also performs the essential function of training people for the industry at large and is often the source of future owners and managers of construction enterprises as well as of engineers, surveyors, foremen, and skilled workers. But the more enterprising tend to leave government departments when they feel they have achieved a level of proficiency which will enable them to compete in the open market. Such a departure by staff may not seem desirable to the ministry concerned, but is, nevertheless, a logical consequence of the lower pay scales and career limitations which apply in government positions.

Being a steady provider of personnel for the industry, force account work can be the origin of good or bad practices. Some work habits become ingrained and can permeate the whole spectrum of a domestic construction industry. As workers transfer from government to private service over the years, they carry with them a backlog of technical and administrative traditions learned in force account work. This highlights the need to introduce and maintain high standards of training within force account operations.

The migration of the better qualified personnel to better avenues of employment has led to a shortage of competent managers and skilled workers in many force account operations. There are also, at times, political pressures on the managers to provide employment, regardless of their actual needs, or to perform work which is politically visible, but often nonessential; bureaucratic mismanagement and chronic funding shortages can result in inefficient use of resources, too.

Normally, force account work should be used only in cases where the nature of the work, or its inherent risks, make it unlikely to attract
competitive bids from contractors; it can also be used to do routine maintenance work, as well as to maintain a basic construction capability within the ministry to train personnel and respond to emergencies. In its training function, force account work can be a useful means for introducing technological change. In Honduras, Kenya, and other countries, for example, labor-intensive construction methods were disseminated through pilot projects under force account.

However, because of their noncompetitive nature, force account operations should not be allowed to grow beyond a level compatible with the regular volume of such work or the nature of emergencies anticipated to arise in the country. On occasions when government departments must complete by themselves work left unfinished by a failed contractor, a permanent expansion of force account strength should be resisted by the government.

If a state-owned construction organization is regarded as essential to carry out a wider scope of work, it should, as far as possible, be autonomous of the government; it should also be allowed to compete with private contractors and other public enterprises, and be disbanded when it is no longer competitive. In the People’s Democratic Republic of Yemen, a special autonomous construction unit, supported by external contract managers, successfully participated in ICB and was awarded a contract for construction of a highway under a Bank-financed highway project in the country. The work is being executed satisfactorily, with continuing support from the same foreign contract management organization.

Parastatal enterprises are not free from the problems which usually affect government organizations. They may, for example, introduce considerable distortions in prices by having access to financing at artificially low rates, or by failing to account for depreciation on equipment, or for services and administrative functions performed for them by government departments. Parastatal enterprises can only perform an efficient service to the economy when these distortions are not present.

The Private Sector

The private sector of the industry covers wide spectra of enterprises and degrees of contractual responsibility. The simplest form of entrepreneurial activity is, in fact, an interface with those who work in the informal sector; they include jobbers, builders, truckers, and small-scale labor contractors who work on subcontract for established construction companies or for public enterprises. The contractual responsibilities of, and risks taken by, these people are limited to the goods or services they supply, without time,
cost, or quality obligations regarding the final product. Financially, they operate under the umbrella of the main contractor.

At the next level, private enterprises acquire further responsibilities, particularly for a finished product, through a subcontract or a small contract. Small urban builders and specialist subcontractors (for example, plumbers and electricians) make up this group. The group also includes small civil contractors working on subcontracts for larger organizations and those contractors whose development is being fostered as a matter of national policy.

In those countries where some professionals become construction entrepreneurs, or where there is a lot of entrepreneurial talent, private companies normally enter the construction industry by assuming full responsibility for contracts. The contractor obtains work competitively by assuming all the risks implied in putting up a tender price and enters into a contract in which he is fully responsible for price, time limit, volume, and quality of the work.

The essential contributions which the private sector is expected to make to the economy derive from its competitiveness, efficiency, and ability to expand and contract in consonance with the wide fluctuations of construction demand. All these factors, of course, mean risk, and it is on the ability to manage the risks associated with the industry (financial, labor, supplies, weather, and so on) that the health and prosperity of the industry depends (more later).

Private versus Public Sector

Publicly owned construction and maintenance organizations usually face considerably more constraints for achieving efficiency than do private contractors. For example, unrealistically low salary levels may not motivate staff; limitations on civil service careers may induce complacency, lack of commitment of the senior staff, and a reluctance to take risks. Likewise, restrictions on the freedom to hire and fire staff and the use of public employment as a social or a political tool may frustrate managers; and cumbersome bureaucratic procedures may affect procurement. As an offset for all these constraints, state enterprises usually are protected from bankruptcy. Many governments would rather cover financial losses than liquidate inefficient public enterprises. In such cases, these enterprises become a permanent drain on the national budget.

Inefficiencies in the management of state enterprises unfortunately are commonplace. For instance, in one country in the Middle East, the average
share of professional, administrative, technical, and clerical staff amounts to 39 percent of the total number employed in over 20 parastatal construction corporations; this is obviously top-heavy when compared with rates of 15 percent to 20 percent for private companies and a few more efficient public entities in the same country. In Africa, the maintenance department of one country’s highway administration achieves a utilization rate of only about 20 percent for major equipment, while employing about 3,000 laborers in excess of requirements. The roads department of a Latin American country, to insure against the bureaucratic delays and problems of importation, made a bulk purchase of spare parts; as a result, a few years after the purchase, it now holds about $500,000 worth of unused and obsolete parts.

It is difficult to make a rigorous analysis of the overall cost-effectiveness of force account and contracting. Force account operations normally record only the use of resources; rarely do they relate true costs to actual production. For example, they omit some important costs by not accounting for overhead and full compensation and benefits for personnel; they also use unrealistic depreciation rates for equipment and omit financial and insurance costs. In the few cases where cost-conscious public administrators have carried full records of costs and production, they show the considerable cost advantages of competitive contracting. One example comes from the state of Parana, in Brazil, where a balanced comparison of highway maintenance costs achieved by force account and by contracting showed the former to be about 60 percent more costly.

Nevertheless, state-owned enterprises perform several essential functions in construction. Therefore, the most important object of policy for this sector must be to ensure improvements in efficiency. In state enterprises, this object is likely to be served by requiring them to adopt a commercial form of organization and to compete with private companies in the bidding for contracts and, where this is not possible, at least to simulate market conditions. Governments should not discriminate in their regulations to enable state organizations to win construction contracts; rather, they should allow private firms and state-owned enterprises to compete on equal terms. The Ethiopian government, for example, is seeking to improve the efficiency of its state-owned construction operations by setting up autonomous parastatals on the basis of existing force account brigades. These new enterprises are expected to be run as commercial organizations and ultimately expect to participate in ICB for work in Ethiopia and abroad.

The quality of management is an important factor that can determine the success of state-owned construction enterprises. This is illustrated by the Special Projects Development Corporation (SPDC) of Western Samoa. Until 1976, it had run inefficiently; that year SPDC hired a new manager with a
strong commercial background. His introduction of hardheaded commercial operating principles resulted in considerable improvements and enabled the SPDC to complete the civil works contract for the Bank-supported highway project in the country on time, within cost estimates, and to high quality standards.
Construction activity is characterized by two important features. First, demand is subject to considerable fluctuations, which can have serious repercussions on the utilization of resources. Second, construction does not depend on a single technique of production; there is usually a wide range of factor combinations (particularly of capital and labor) that can be tailored to suit each finished product. Both areas can be influenced by economic measures: the former through planning and demand management, the latter through pricing policies which encourage the use of the most economic factor combinations.

Characteristics of Demand

The output of construction fluctuates considerably more than that of manufacturing and the economy as a whole, as shown for a number of countries in the figures on pages 99–106. This tendency is inherent in the demand structure of capital goods industries where relatively small changes in demand by consumers will cause the production capacity to be expanded or contracted at a considerably higher rate. Not only do the private sector resources and demand fluctuate with export earnings, but important public sector investments also tend to concentrate during periods of rapid economic growth, thereby accentuating the cyclical variations. The fluctuations in construction activity, relative to those of other sectors, tend to be greater in developing than in developed countries. If national policies succeed in stabilizing the economy, they would stabilize demand for the construction industry, too. In strictly sectoral terms, however, the solution will have to be sought in those measures that even out the demand for the construction industry directly; these measures are discussed in Chapter 4.

The public sector plays a dominant role in generating demand for construction. This is particularly so in developing countries, where it can account for 80 percent or more of the relatively modest demands on the formal construction sector. For instance, a construction industry survey in Liberia estimated the total construction volume in the formal sector to be slightly less than $20 million in 1978, of which the private sector accounted for less than $4 million. Similar ratios apply in Burma, Nepal, Papua New Guinea, and several countries in Africa. Surveys made in Egypt and
Indonesia in 1979 place the public sector share of the total demand at 65 percent ($2.3 billion) and 75 percent ($4 billion), respectively.

The government's share of total demand is also high in such capital-abundant countries as Kuwait, Libya, and Saudi Arabia, which are continuing to develop their basic infrastructure. The importance of the public sector as originator of demand is, however, not limited to the developing countries alone, although the share tends to decrease at higher levels of development. In the United States, for instance, the demand generated by public bodies in 1982 was roughly 50 percent of the total demand; this estimate, however, excludes the construction of single-family homes.

The twofold role of the government—as policymaker at the macroeconomic level, and as an originator of demand and executor of works at the microeconomic level—stresses its importance for the sector. Through the timing of its investments, the government can influence fluctuations in demand for construction. Similarly, the government's overall economic policies and specific industry-related regulations can have a profound influence on investment decisions of the private construction sector.

**Effects of Construction on the Economy**

Fluctuations in construction demand affect the economy in many ways; they affect the demand for labor and materials as well as the lag in the time taken to supply the industry's output. Backward linkages, in particular, can have widespread impact because much of the raw, semiprocessed, and processed materials can be provided by relatively unsophisticated labor-intensive domestic sources and by basic industries such as cement and steel manufacturing. Forward linkages affect practically all other sectors of the economy. In fact, construction has been ranked among the top four out of twenty economic sectors in terms of intersectoral linkages.

These linkages, combined with a high, value added-to-output ratio, indicate that construction provides a substantive growth stimulus throughout the economy (see Table 1). Its importance as an agent for development is enhanced by its ability to provide gainful employment for a large number of workers. Much of the demand for labor is often met by taking unskilled workers from rural areas, who can subsequently be trained for more demanding jobs. Construction is often the only significant alternative for farm labor, particularly as it can adjust to the labor needs of harvesting seasons to a larger degree than manufacturing.

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Main Construction Inputs and Pricing

The main inputs in construction are management, personnel, equipment, materials, and capital. The relative importance of these inputs varies from job to job for civil and building construction and also depends on the choice of technology. Table 5 illustrates typical differences in input participation arising out of adoption of two different construction methods—one making intensive use of labor, the other of equipment. There are also considerable differences in overhead costs. However, the added requirements for personnel management in labor-intensive construction are balanced to some extent by heavier capital servicing in equipment-intensive construction. Labor-intensive civil construction, in addition, requires a substantially different form of organization and supervision from that associated with the use of modern equipment. Actual project costs, naturally, show greater variation in the composition of costs than implied by the figures in this table.

The choice of technology is influenced by prevailing prices for labor and equipment, especially when they do not reflect true economic costs. For example, prices for imported equipment may be set below their economic costs as a result of undervalued exchange rates or exceptionally low tariffs. By contrast, labor costs may be kept rather high by legislating a minimum wage or through the organization of the labor market by trade unions. For instance, the legal minimum wage in civil works construction in central Ecuador was $6.20 equivalent per day in mid-1981; the rate that prevailed in the market, however, was $1.70, a wage paid by provincial manufacturers.

In India, on the other hand, Bank-sponsored studies showed a close proximity between wages offered in the construction industry and those

Table 5. Approximate Input Significance in Construction of Roads in Developing Countries

<table>
<thead>
<tr>
<th>Input</th>
<th>Labor intensive</th>
<th>Equipment intensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>55–70</td>
<td>20–30</td>
</tr>
<tr>
<td>Equipment</td>
<td>10–20</td>
<td>40–60</td>
</tr>
<tr>
<td>Materials</td>
<td>10–20</td>
<td>10–20</td>
</tr>
<tr>
<td>Overhead and profit</td>
<td>10–20</td>
<td>5–15</td>
</tr>
</tbody>
</table>

Source: World Bank
prevailing in the market; this was so because of the absence of minimum wage regulations (except in one emergency area) and the free operation of bargaining and productivity-based remuneration. This freedom of the labor market has been an important factor in determining the choice of technology for construction; in a labor-abundant economy, such as India, it led naturally to the use of labor-intensive methods and to the establishment of local labor-intensive contracting businesses. If entrepreneurs are given freedom of choice, they will naturally go for the most cost-effective method.

**Labor-Intensive Technologies**

Labor-intensive technology played an important role in the early stages of development of infrastructure in the more developed countries. The railways, highways, and canals built during the Industrial Revolution are a good example. Today, opportunities for building infrastructure using a similar, but appropriate, manual technology exist in many countries of the developing world. In fact, these construction methods, which do not require large capital investment, can be a means for establishing a civil engineering construction subsector in countries with an incipient construction industry.

Concern about the excessive use of machinery in civil construction in capital-scarce, labor-abundant economies prompted the Bank to launch a research and demonstration project in February 1971. The project attempted to find ways to substitute labor for capital in the construction of roads, irrigation canals, and other civil works. For this purpose, the Bank organized and managed a trust fund, which was subscribed by the Bank and nine industrialized countries.

The results of research and application work carried out in Honduras, India, Indonesia, Kenya, and other countries showed that labor-intensive methods were technically and economically feasible for a wide range of construction activities and their product was of a quality comparable to that produced with equipment-intensive methods.

Whereas traditional labor-intensive civil works construction has frequently been inefficient, the introduction of managerial and technical improvements can lead to considerable increases in the productivity of labor, to the point that labor-intensive methods can be fully competitive with equipment-intensive technology for many types of works in labor-abundant areas. For instance, in southwestern Honduras, about 130 kilometers of new rural access roads were built during 1976–80 by making intensive use of labor; they cost, on the average, $10,000 per kilometer—an average

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9. Canada, Denmark, Finland, Germany, Japan, Norway, Sweden, United Kingdom, and United States. India and Indonesia also collaborated with the study.
considerably lower than the estimate for equipment-intensive construction of similar roads in comparable terrain.

Experience has shown that major labor-intensive construction operations can be mounted if serious efforts are made and an abundant supply of well-managed labor is available at competitive wages. In the mid-1970s, these wages were found to touch a threshold of $2 per day in most labor-intensive operations. The threshold may have increased to between $3 and $4 per day in 1982, depending on the productivity of the laborers and the nature of the work. Despite this increase, wage rates are not significantly higher, in real terms, than those of the mid-1970s. If anything, capital is relatively more scarce now and, because rural unemployment generally has not decreased, labor continues to be abundant, making the labor-intensive option more attractive economically.

The application of labor-intensive techniques should merit close attention for many types of work in some 50 countries where rural wages are about $4 per day or less. Of course, attention will need to be paid to the relative prices between labor and capital and to other distortions that affect factor intensity and the choice of technology; these may have to be overcome before labor-intensive construction can be considered. Guidelines for planning and managing labor-intensive construction work are presented in a new Bank publication.

With the exception of the cases noted in India, the labor-intensive work under the Bank’s research and demonstration project was carried out by force account operations. In these operations, it is often possible to pay labor by its economic value, while private industry is bound by minimum wage laws and union agreements which raise the cost of hiring unskilled labor substantially. In Kenya, for instance, construction contractors had to pay about 40 percent higher wage costs than the government-run labor-intensive road construction program. In most countries, appropriate labor-intensive technologies have failed to interest private sector contractors because they have been deterred by pricing distortions such as these, by concerns about an excessive dependence on the labor force, by fears of potential unrest resulting in escalation of wage levels, or by the lack of adequate funds to support the cash flow requirements of this type of work.

Attempts to reform labor laws can often be difficult and slow. In many countries, a need therefore arises for community, regional, and ministerial initiatives to develop imaginative ways of enabling the construction sector to

reach a better balance in factor use. Examples of such initiatives include community and individual self-help construction schemes; community works programs combining wage payment with some recourse to self-help principles to reduce the effective average price of labor; and other demonstration programs on the use of efficient labor-intensive techniques in construction.
4

Government Policies and Procedures

The government’s influence is felt strongly on both the supply and demand sides of construction. This is particularly the case in civil construction, where the rules for marketing and contractual relationships are usually laid down by the government. Building construction is less subject to the government’s influence, since a considerable part of its demand arises in the private sector. It is, however, subject to other forms of actions by the government which affect the whole spectrum of the industry. The actions include policies and legislation affecting licenses and permits, sanitary and building codes, minimum wages, corporate taxes, rules on the importation of materials and spare parts, and the terms and availability of financing for construction.

Measures Affecting Demand

The planning and execution of government works programs. Government actions affect the construction industry most directly at the microeconomic level. Poor planning and execution of public sector projects frequently exacerbate the severe fluctuations in the demand for construction. Poor planning and execution can also lead to the loss of key personnel (such as engineers and skilled workers), who are difficult and costly to replace, and to the inefficient use of construction equipment, which may be made to lie idle. The losses to the industry can, at times, be permanent when, for instance, trained personnel emigrate, or inactive equipment becomes obsolete or too costly to recondition; or companies are unable to meet their financial obligations and, therefore, are forced to liquidate. These risks are likely to discourage investment in the industry and, in the early stages of its development, the entry of high-quality management.

The seasonal and cyclical nature of demand as well as instability due to changes in government and, therefore, in development policy can cause instability in demand; this imposes a cost on the economy, part of which can be reduced through conscious effort. Stabilizing demand is neither easy nor cheap. Nevertheless, a variety of measures has been used or considered to achieve this objective. One way is to even out the demand emanating from the government by planning its works program better, or by countercyclical
phasing, and programming the implementation of projects after taking into account the aggregate construction demand from all ministries as well as the construction capacity of the industry.

To moderate the peaks of construction demand, it may also be useful to examine the timing and staging of construction of the few large, bulky projects. These projects usually tie down a sizable part of the funds generally available for construction and, because of their size or specialized nature, they often must be built using foreign contractors. In some instances, large projects have used up the capital resources available for investment in national infrastructure to such an extent that there were little or no resources left for the development of smaller works by the local industry.

The moderation of peaks of construction demand, basically a long-term planning exercise, must be linked with short-term forecasting of funds available to the government. The aim should be to avoid an excess concentration of bidding and contract activity after the approval of national budgets, followed by inactivity and delayed payments later in the financial year.

Nevertheless, the peaks and troughs of demand will remain, however dampened. But underlying them there should always be a base line, consisting of maintenance, reconstruction, and recurrent construction work. A thorough knowledge of the capacity of the domestic construction industry would assist in determining its potential to satisfy that "base load," the need to assist in the development of the domestic industry, and the potential need for imported services to meet peaks in demand.

OTHER MEASURES. Sound policies on interest rates and taxation (including provisions for investment and allowances on depreciation) could spread out the demand for construction, but these are seldom applied. Construction tends to be undertaken when financial resources become available (for example, in periods of good export earnings); this adds to inflationary pressures caused by constraints on construction capacity and shortage of materials. An incipient domestic construction industry is particularly vulnerable to these pressures.

One possible measure that can be considered by governments to stimulate construction is the establishment of a countercyclical credit policy which would create a reserve fund in periods of high demand to be released for investment during economic downturns. However, such policies are difficult to establish for political reasons. Furthermore, although it may be possible to restrain credit at certain periods, the revival of demand during the low phase of a cycle will depend not only on the relaxation of credit, but on a range of other factors, including general fiscal and monetary policies.
Measures Affecting Supply

PRICE INCENTIVES. Some countries have fostered the development of their domestic contractors by protecting them from crippling risks and assuring them of profits for reinvestment. Brazil has followed this path to develop its domestic construction industry; it is also being applied in Kenya by the Ministry of Transport and Communications to develop an indigenous road construction industry. In such cases, contracts with generous unit prices and flexible programs are negotiated; government supervisors also provide counseling and guidance in construction technology, contract procedures, and financial management to foster learning and capitalization in local infant industries. It is generally agreed that these incentives should be restricted to the formative period of the industry; however, if continued for long, inefficiencies and economic difficulties may arise. In addition, it might be difficult to remove these benefits after they are no longer required.

For international competitive bidding (ICB) on Bank-financed civil works, a preference can be given to domestic contractors in the evaluation of bids in countries whose income per capita is below $410 (1982 dollars). However, in only a few cases has the 7.5 percent preference been a deciding factor in the award of contracts. In part, this is due to the "graduation" of potential users of the preference upon the country reaching a threshold of $410 (in 1982 dollars) in its income per capita, at a time when the domestic construction industry was reaching a level of development at which it could have competed successfully with foreign companies with the assistance of the 7.5 percent preference.

TAXATION. Little is known on tax incentives for the construction industry worldwide. Further reviews are needed, on a country-by-country basis, before any specific recommendations can be made. The taxation regime of a country can have an important effect on the development of the industry. An incipient construction industry can be assisted by tax incentives, such as tax holidays, investment or reinvestment allowances, accelerated depreciation on equipment, and customs duties exemptions. However, such incentives must be temporary and cover only the formative period of the industry.

Incentives, in general, can foster growth of the industry and can also promote the export of its services. For example, the Republic of Korea allowed an accelerated rate of depreciation (20 percent bonus) for construction equipment. Concurrently, and in order to increase earnings of foreign exchange, domestic construction firms (as well as other exporters)
were exempted from business tax and were given a 50 percent tax credit against income and corporate taxes for all the foreign currency earned. This helped in developing the country’s construction industry and led to its success in exporting its services.

In levying taxes on the industry, it is important that the special characteristics of the market, such as fluctuations in construction demand, be taken into consideration, for example, in special profit or loss carry-over arrangements for the industry. Perhaps, a study of demand fluctuations can be made in each country; this might reveal the existence of cyclical patterns of construction activity. On the basis of these patterns, a “carry-over period” (to determine taxes on profits or credits on losses) can be determined and a special tax adjustment formula developed. At present, some countries tax construction on the basis of the gross value of finished work; others, on annual turnover. These levies, however, do not take account of actual profitability, nor allow for the variability of construction demand. Nevertheless, the levies are necessary when the industry does not carry accurate accounting records, purposefully or through lack of sophistication.

In many countries, import duties can be a significant burden on domestic contractors. When down payments, freight costs, insurance, and agency charges are also added, the initial cash outlay can be up to 60 percent of the free-on-board value of the equipment purchased on commercial credit. If the import duties were collected in monthly installments, the financial burden could be reduced considerably.

Further, in internationally financed work, domestic contractors are often at a disadvantage because they have to bid on the basis of equipment for which they have paid full import duties, while foreign firms pay no such duty. One solution to this problem would be to require that foreign contractors pay duty on the amount that the equipment depreciates over the contract period. Full duty could be collected at the time of importation and the balance, calculated on the residual value at the end of the contract, refunded upon re-export of the equipment. Alternatively, foreign contractors could post a bond for the full value of the duty which could be redeemed after payment of duty on the value used in the contract and upon re-export.

**Contracting Procedures.** In principle, construction services should be procured with the aim of achieving economy and efficiency. In countries that are developing a domestic construction industry, this long-term objective must be reconciled with the shorter-term goal of providing a financial advantage to the employer, considering the capacity of domestic entrepreneurs to manage risk. More generally, procurement practices should
be fair and lead to contracts that adequately protect the rights, and stipulate the obligations, of both parties.

Fair bidding procedures are a means for establishing good procurement practices. The preferred method is that of awards made to the lowest evaluated bid received from prequalified bidders. For the larger tenders, prequalification is an involved process, devised with the specific characteristics of each project in mind. For smaller tenders, which a government calls at frequent intervals, and which normally attracts local bidders, it is preferable to maintain an up-to-date classified register of contractors, setting up categories of firms by the size of contract they can undertake. Such a permanent prequalification system must be linked with a good flow of information regarding the ongoing commitments of the bidders; it must be based on readily verifiable information; and the system for updating must be simple and easy to operate with scarce resources.

Because lists of equipment, *curricula vitae* of personnel, and financial statements can be modified to exaggerate a company's net worth or because data made available become obsolete in a short period, it is preferable that classification of contractors be based on evidence that is legally binding, generated regularly, and subject to verification by tax authorities; this includes information on owners' equity, annual turnover, and profit. The technical competence of contractors can be assessed on the basis of the production of certificates of completion of projects coupled with regular inspection by qualified registry personnel.

Governments use various methods to foster domestic construction enterprises through the contracting process. Sometimes, foreign bidders are required to have local participation of a certain minimum percentage. Many times, parastatal construction enterprises are also given direct access to contracts at noncompetitive prices. Because negotiated contracts usually result in the payment of a premium by the contracting authority, they need to be used with great care. Legislation in some countries explicitly forbids them.

The system of "slicing and packaging" of suitable projects has shown some encouraging results. Though preparation, supervision, and administration of a larger number of contracts can be inconvenient, the system does provide an excellent opportunity to help the development of domestic contractors. A good example is Brazil which has built three highway projects with Bank assistance using this system. In the first case, a project completed in 1975, 106 Brazilian firms and joint ventures and two foreign firms were prequalified; 92 firms presented proposals for the various lots and combinations of lots. In all, 52 contracts were awarded, for a value 11 percent below the appraisal estimates. The number of bidders was equally large for second and third "sliced and packaged" projects (completed in
1978), which were subdivided into 45 and 24 contract lots and resulted in awards at 26 percent and 9.5 percent, respectively, below the estimates made by engineers. All three projects were completed successfully, with only minor contract problems. Slicing and packaging, thus, opened up large projects for bids by domestic firms and placed them in an international competitive arena.

**Contract Types and Construction Risk.** The type of contract that is signed has a significant bearing on the risk taken in construction. In the cost-plus contract, the contractor is reimbursed for all his costs and is also paid a fee; the owner assumes practically all the risk. In a lump-sum contract the contractor is paid a total sum for the job and is expected to bear most of the risks. Then there are contract forms in which risks are shared more evenly between the parties. For instance, in the unit-price contract, work quantities can be adjusted and the contract amount is flexible; while under the target-price contract, contractors are reimbursed actual expenses, but a measure of risk and incentive is introduced by linking the fee to performance, which is determined by a preset standard.

Incipient contractors can be coached to increase the risks they can take and manage by gradually introducing various types of contracts. The first stage could consist of a least-risk type of contract, such as cost-plus, followed by a unit-rate contract which is limited to one item (for example, the supply of gravel or the laying of bricks). At later stages, full unit rate contracts, first negotiated and later won in competition, would be used. This approach has been used in Sub-Saharan Africa, generally with good results. It must be stressed, however, that cost-plus and negotiated contracts are not conducive to cost efficiency, and, therefore, should be used only when excessive risk or the learning process justify them.

**Contract Conditions and Administration.** Very frequently, "one-sided" contracts formulated by administrative authorities stem from an erroneous belief that, to ensure good quality at a minimum price, the authorities must have the upper hand in managing the contract. The whole onus of risk is, thus, placed upon the contractor, who may be required to cater for all eventualities, including some (for example, civil unrest) completely outside his control. If the contract does not appear to be fair to contractors, they will perceive additional risks in the contract and raise their price accordingly. Conversely, failure to perceive those risks may lead to difficulties. In both cases the real loser is the public, either by having to pay a premium or by having to suffer the consequences of contractual difficulties and default.

Among the most serious shortcomings of the one-sided construction contract is the lack of compensation for delays in payments. Delays generate
additional financial costs and sooner or later must be borne by the client. The solution for this widespread problem is to include legally enforceable measures in the contracts, such as the one included in the General Regulations for Public Works Tenders and Contracts of Peru. It stipulated the accrual of commercial interest (at a rate fixed from time to time by the central bank) on delays beyond the specified payment period. It is extremely difficult for a public service administrator to pay interest which has not been budgeted; the provision therefore resulted in prompt contract payments. The importance of ensuring the permanence and dissemination of such a safeguard needs to be stressed.

Another difficulty lies in the making of necessary adjustments for escalation in costs. If the provisions made in the contract for these adjustments are inadequate, contractors are likely to overprice their services. To avoid this problem, it is better to permit actual increases in cost to be calculated against regular valuations; however, it is a cumbersome system to apply and requires considerable effort of the contractor and the client.

The adjustment method most commonly used is the application of escalation formulae; these are prepared for groups of unit rates which contain similar cost elements (for example, in a highway construction contract, items related to surfacing could include labor, equipment, fuel, bitumen, aggregate, and overhead) which can be related to individual price indices. When the price levels of the cost elements represented in the formula change relative to the initial index values (usually set at the date of tender), the unit rates are adjusted. The formulae must be carefully established for each project on the basis of a thorough analysis of all relevant factors and include, where warranted, a nonadjustable element. In one contract in South America, for example, escalation formulae were used which contained an unduly high, and poorly defined, labor element. Because of big increases in wages, the client has had to seek a court decision over a $4 million escalation claim by the contractor on a two-year contract worth $10 million; the problem clearly arose from the strict application of the letter of the contract.

There is little doubt that the introduction of fair and equitable terms in contracts can benefit the construction industry and improve the quality, timeliness, and cost of production. There are many examples of contract conditions which have been prepared in close collaboration among contractors, employers, and consultants and are conducive to better pricing and generally harmonious development of the contract. For instance, the contract form prepared jointly by the international federations of consultants and contractors (known generally as the Federación Internationale des
Ingenieurs Conseils [FIDIC] Conditions of Contract) is often used in work funded by the Bank and other international agencies.

Other problems commonly associated with contract administration include poor short-term planning by the contracting authority, which often results in insufficient budget appropriations; delays in the acquisition of land; incomplete tender documents; inadequate cost estimates; and a lack of perception of the necessary lead times.

CONTRACT DOCUMENTS FOR THE "INFANT INDUSTRY." Contract documents are often based on the practices in industrialized countries; they may be incomprehensible or impractical in a developing country, particularly one in which the construction industry is in its infancy. There are problems of language, when the wording of the contract is archaic or excessively complex in the originating country; of design, when the methods and materials prescribed for a project do not take into account the locally available alternatives; and of procedure, when the specifications are based on performance judged on the basis of a standard or code of practice that is set in an industrialized country.

What is required, therefore, are contract documents that use simple language and are compatible with the experience of the end user. Designs need to incorporate local practices and materials; and drawings, specifications, and bills of quantities also ought to be clear, self-explanatory, and related to methods and procedures as well as to performance.

Simplified contract documents have been used successfully in several countries in the Caribbean for the construction of low-income housing by small domestic contractors. The documents were broken down by operation; this made it easier to subcontract or manage directly each operation as a discrete element, having its own drawings, quantities and specifications. The bill of quantities was disaggregated: it provided an estimate of the labor, materials, and equipment required, as well as of the duration of the work for each item. The specification included guidelines to be followed during construction. The various operations were integrated into a suggested job program which identified critical operations and enabled the contractor to program and monitor his labor, materials, equipment, and cashflow and also served as a format for supervision of the contract. This is an excellent example of well-rounded technical assistance aimed at carrying out a construction project and at the same time developing local construction capability.

SUPERVISION OF CONSTRUCTION. The quality of supervision affects, in particular, small enterprises that cannot afford the means to provide a high degree of quality control and, therefore, must rely on the client's supervision. Defective workmanship or materials, if not corrected at an early
stage, may later require extensive reconstruction forcing the contractor into incurring nonrecoverable extra costs. The problem has arisen particularly in countries of Sub-Saharan Africa, in cases where the client's supervision has been weak or deficient, or where the client has not been able to cooperate with an inexperienced contractor. In places where the construction industry is at an early stage of development, supervisors, in fact, may have to provide a considerable amount of technical assistance.

In a wider sense, the smooth implementation of construction contracts requires the appointment of a trusted resident engineer (who could be the client's chief supervisor on site) with full authority being given to resolve onsite construction problems. Very often, this is not the case; delays occur as a result of consultations with headquarters and are a source of increased costs, claims, and disputes between the contractor and the client. There is a close relationship between the scale of the project and the qualifications a resident engineer needs to have to be given a certain latitude in his judgment. An increase in complexity and size of the works will require a corresponding increase in the qualifications and experience required for the job.

When government departments are short of personnel, or special experience is required for large projects, consultants are usually employed to supervise. As a rule, this is a satisfactory arrangement and should be followed until the government can develop its own capability. However, problems can arise in cases where the client interferes in day-to-day work, or the consultant is incompetent, or the consultant does not abide by a strict code of ethical behavior. It is imperative, therefore, that care be exercised when selecting supervising consultants; only the services of firms of proven experience who are capable of giving the full service required should be selected. The selection criteria should include, where appropriate, a proven ability to provide technical assistance to fledgling construction enterprises.

IRREGULAR PRACTICES IN CONTRACT ADMINISTRATION. These are present throughout the construction world whether in developing or developed countries. Indeed, in some instances both parties to the contract recognize extraneous commissions as a regular business expense. Very frequently, irregularities in administering contracts can find their origin in complex, contradictory, or inconsistent government regulations and poor salaries paid to staff. The former create an environment in which irregular practices can arise; the latter stimulate them. A well-remunerated career structure for the permanent staff within each ministry can help mitigate this problem in the long run. Another effective solution, especially in the short term, is the use of open, competitive bidding for procurement.

Competitive procurement, particularly when it is open to foreign bidders, also prevents collusion among contractors. Pricing "clubs" or cartels are
difficult to detect and correct in the absence of external competition. Nevertheless, many governments need to improve the ability to identify and correct opportunities for such collusion.

An innovative approach was adopted in 1979 by Argentina's Highways Directorate which decided to contract out most of the routine maintenance of trunk highways. Thirty percent of the work was reserved for the directorate's force account to be carried out and supervised as if it were an individual contracting unit within each maintenance district. This feature was introduced as a measuring rod with which to assess the competitiveness of contractors' offers; it was also intended to reduce the chances of the district offices diverting their resources meant for maintenance to activities not linked with the highway system but induced, for example, by political pressure. Although the original system was modified later because of difficulties in managing an awkward contract form, the features it introduced and particularly the incentives for competition among contractors and with the government's force account teams are worthy of replication.

Responsibilities within the government. Unlike agriculture, mining, and manufacturing, which usually have a government department concerned with their development or interests, the domestic construction industry often lacks such an interlocutor in government. The construction industry cannot develop without a government's commitment and long-term active support; without them, any improvements achieved are local and temporary. Some governments are beginning to realize these needs. Sri Lanka and Indonesia, as pointed out earlier, are two good examples of countries striving to develop their domestic construction industry. In both cases, the World Bank extended support only after the governments indicated their commitment to assist the industry.

Perhaps the best example of positive government action is that of the Republic of Korea; its construction industry has become highly developed and one of the leading exporters in the world. Certain factors, unique to postwar Korea, assisted in the initial stages. Among them was a massive task of reconstruction which, with the support of external financial assistance, created a substantial domestic demand. The existence of war-surplus construction equipment in large quantities helped, as did the presence of a highly disciplined and motivated labor force.

However, direct government support was a decisive factor in the development of the industry. This was channelled through the Ministry of Construction (MOC), which is entrusted with the execution of public works programs, particularly in transportation and multipurpose projects. The
ministry has a special bureau which is responsible for developing the construction industry. The bureau drafts regulations affecting the industry, for example, on taxation and export incentives, and (less successfully) on wages and profits in government contracts; it also liaises with the industry's very strong representative association. The ministry is responsible for planning most of the government construction expenditures at the national level and provides the continuity of work upon which the industry can grow. Lately, MOC has brought forward the construction of several major projects to compensate for the slump in the international market and to ensure a continued utilization of the Korean construction capacity.

To develop the smaller firms, MOC began to stratify competition. In the 1960s, for example, large jobs in highways construction were subdivided in slices. The larger companies were not allowed to bid for these specially "sliced" projects; this resulted in keen competition among, and participation by, the smaller firms. Although the economies of scale were forgone, longer-term economies from the competitiveness of the industry were achieved. The government also assisted civil contractors by renting out its own equipment, or by making available special credit lines for the purchase of equipment. Some of the credit made available came from bilateral trade balances.

For a government to establish an office responsible for the development of the construction industry, the process should start by creating an awareness of the importance of construction as a factor of development. The contributions that the industry makes to GDP, capital formation, and employment are strong arguments in favor of setting up this government facility. The office can be located in the ministry which makes the most use of construction (for instance, the Ministry of Public Works in Colombia, Indonesia, and Kenya). In Peru, the office was located until recently in the Ministry of Housing and Construction; in Ethiopia, the responsibility rests with the Ministry of Construction. In countries, where the execution of public works is distributed among several departments, a good starting point for the construction office could be the Planning Department; however, in the long run, it will need to be associated with the department that makes most use of the industry.

INFORMAL SECTOR AND ORGANIZED COMMUNITY CONSTRUCTION. Unfortunately, less attention is paid by governments to these activities in spite of the fact that with relatively minor financial help and strong technical assistance, a considerable impact can be made in housing, education, health, sanitation, irrigation, transportation, and so forth. In remote areas of Sub-Saharan Africa, for example, the most economic way of building small schools and sanitary facilities is by employing local, self-help builders or by mobilizing the local population.
There are many other examples which illustrate how government actions in support of community and individual self-help effort have led to successful programs. In Peru, Cooperación Popular has provided technical and financial assistance to communities in remote locations for construction of access roads, irrigation facilities, school rooms and so forth. In Paraguay, the Bank helped finance schemes for providing water supply and sanitation to rural communities which organized their own labor to complement cash, materials, and specialized construction services provided by the National Service of Environmental Sanitation.

In Botswana and Zambia, prospective owners of low-cost houses in Bank-assisted urban development projects were assisted with the allocation of plots and in the supply of materials purchased in bulk and stored by government agencies responsible for the projects. Technical assistance was given to the owners or individual builders who carried out the construction. As the informal builders progressed from house to house, they improved their skills and the durability of the dwellings they erected. In time, some of the self-helpers and tradesmen established themselves formally as builders and began operating in the open market.

Experience has shown that nongovernmental organizations (NGOs)—these include charitable, religious, international, and local organizations—can be an excellent channel for reaching local communities, developing small projects, and upgrading local construction capabilities. In Lesotho, a religious NGO organized remote communities into gathering local materials and contributing their labor to build schools in their townships at a cost that was considerably cheaper than what could have been achieved by force account or by established contractors from other areas. Technical assistance was an important contribution of the NGO in this case; it is so elsewhere, too. Some NGOs work exclusively in the construction field: the Compagniens Batisseurs, for instance, assist informal sector builders and small contractors in French-speaking Africa.

NGOs usually operate at the grassroots among the poor; they seek the participation of the intended beneficiaries in the designing and implementation of their projects; they are also generally flexible to adapt their activities to suit local needs and conditions. In addition, NGOs often help overcome problems of bureaucratic rigidity, as for example, in the procurement and award of construction work to illiterate builders who cannot take part in a formal bidding process. Collaboration between government agencies and NGOs can go a long way in assisting the informal sector and community organizations. A large number of NGOs are active in developing countries: in Bangladesh alone, some 110 foreign voluntary agencies are registered. In coordinating NGO activities to meet national objectives, governments can
help ensure that a construction capability is developed in the informal sector and among organized communities.

Among the actions that governments can consider to assist self-help efforts are the following: studies of training needs, availability of materials, and suitability of building codes for construction in the informal sector; organization of technical assistance to provide on-the-job guidance; training paraprofessionals to provide this service; launching of pilot projects to induce, for example, the use and improvement of traditional construction materials; providing duly titled house building plots, equipped with the basic utilities; and easing the supply of materials and credit to self-help individual and community builders.
Entrepreneurial Requirements

Diagnoses of the problems affecting construction enterprises—and often the entire construction industry of a country—often take the form of encyclopaedic listings of ailments. As a rule, they miss the important point that many of those ailments are only symptoms of the underlying problem of weak enterprise management. Management deficiencies need to be overcome, at the same time as other deficiencies are being tackled, if the aid package is to succeed. The importance of good management is underscored in developing countries by the fact that the industry must operate with limited and unreliable resources and face a considerably wider and more stringent range of risks.

Enterprise Management

Few owners of construction companies realize the need to train themselves in the skills needed to manage an enterprise (as opposed to site management or technical and clerical work). In larger units, it is important to acquire the skills and trained personnel that will enable owners and managers of enterprises to delegate technical and junior management responsibilities to others in order to concentrate on general management.

Deficiencies in management arise from the genesis and life cycle of construction companies in the private sector. These companies usually are started by one or two ambitious professionals, technicians, or tradesmen who wish to strike out on their own. These people may manage a small unit well; in fact, they may prosper in the first phase of the enterprise's development, when the needs of management fall within their grasp. But when the enterprise grows and management requirements expand beyond the capabilities of its owners, they can lead to difficulties or even extinction of the company. The problems are similar in state-owned enterprises; technical expertise and dedication to work may be rewarded with promotion, which could eventually take the individual beyond the threshold of his managerial competence. In the public sector, this problem is compounded by management constraints and the absence of appropriate incentives.

There is a double loss in the process of promoting highly skilled technical personnel to higher management levels. Good technical people are displaced from the jobs they know best; at the same time, the industry acquires managers who are ill-equipped to manage. In both cases, the cost to the
industry in terms of training new technical personnel, loss of technical experience, and enhancement of the risk factor is considerable. It is essential that technical competence be rewarded with appropriate incentives; however, promotion to higher levels of management must be conditioned by management skill.

Managing the construction industry requires a certain amount of flexibility to adapt to rapidly changing circumstances, particularly changes in the characteristics of demand and the series of expansions and retrenchments that are typical of the industry. The owner or manager of a small unit, when committing his enterprise to a contract, needs to comprehend and evaluate the risks as well as the obligations (both management and technical) which result from such a commitment. In order for growth of an enterprise to be achieved successfully, it must be gradual, particularly in countries without long-standing entrepreneurial tradition.

The development of small indigenous civil contractors in Kenya can serve as a good illustration. The Ministry of Transport and Communications followed a step-by-step approach in enhancing the span of construction activities and risks of management, while keeping them within the grasp of incipient entrepreneurs. Despite a general shortage of modern entrepreneurial skills, contracting firms have been developed by starting with simple tasks, such as the haulage of construction materials. Many of those companies have now moved on to simple construction operations (such as road gravelling, for example) under generous contract conditions. In the future, a measure of risk and competition in the winning and management of contracts is expected to be introduced.

In many developing countries, managers often commit their firms to bid prices based on clients' estimates, without carefully analyzing each job and its risks. This failing is common to many private firms which lack a structured management. It is not uncommon for managers to try to cope with the technical and clerical workload (like running site operations, collecting payments, dealing with contract correspondence, and so on) as well as general management. In a properly structured situation, a general manager would coordinate the preparatory work of his estimator, site manager, accountant, and the people in charge of personnel, equipment, and supplies and reach a decision on a bid price after collating and analyzing their information. A manager who cannot afford to delegate these functions will need to recognize the limitations of his firm and take up only one or two projects that he can handle properly.

The absence of, or inadequate, delegation also affects state-owned enterprises; but in such cases it arises more as a result of political interference and the absence of basic management discipline. An example was cited
earlier of parastatals in the Middle East which are plagued by swollen staff numbers, poor planning, low productivity, and inadequate quality control. Nevertheless, in a generally dark picture, at least one of those parastatals found a way to prosper; it introduced incentives for its managers and staff through profit sharing and productivity bonuses and offered a pay which was competitive with the private sector for people who performed above the norm. The manager of this corporation has also been given the essential freedom to hire and fire staff. It is an exceptional example, worth following.

**Training Managers**

A very efficient way of introducing the concept of general management in a construction company is by teaching senior officers in peer groups, preparing them, in particular, to train their own staff in the skills required for delegation of responsibilities. Training techniques have been developed in industrialized countries, and are gradually spreading to the developing world, often through well-established affiliates of international business schools. In Colombia, the Bank expects to finance a training program for general managers and company owners of the construction industry, using a combination of a Colombian private business school and foreign trainers. The program will concentrate on the principal management functions and on the introduction of effective systems for delegation of responsibilities. To relate theory and practice, training will be supported with case studies drawn from local experience. Hitherto, the construction industry has not availed itself of the services of excellent Colombian business schools, which are well patronised by other local industries.

Joint ventures and other forms of association with foreign contractors have also been tried as a means of developing domestic construction companies. This approach may result in the formation of good subordinate cadres in the local firm, but the transmission of management know-how usually is incomplete. In the case of associations, the foreign contractor frequently sees the local firm as a partner of necessity. The foreign contractor assumes financial risks and obligations and, to protect his investment, takes control of senior management. The local partner is then relegated to handling public relations and some other technical activities. Exceptions occur, of course, when the local partner has a sound management background. In such a case, the association can then become a true partnership. In essence, a domestic contractor must first equip himself with management and other resources required, before being able to have a meaningful and profitable relationship with a foreign partner.
Likewise, subcontracting is viewed by contractors as a convenient means of saving on the acquisition of services or semiprocessed goods. The relationship which develops between the principal and subcontractor is a strictly commercial one; where the subcontractor performs poorly, he is replaced. The only instance when the main contractor will provide technical and financial assistance to a subcontractor is when the latter is the only supplier of a particular good or service in the market and therefore needs to be protected.

The development of managers in the Korean construction industry merits special mention. A large number of civil engineers (700 to 1,000 in the 1960s) graduating annually from Korean universities had considerable opportunities available for them to enter the industry during the period of postwar reconstruction. This situation made it possible to select and train personnel in a competitive environment which benefited both the industry and the economy. The construction market being relatively large, it readily adjusted for localized inefficiencies.

However, for this process to be replicable elsewhere, two conditions are necessary: the presence of a large number of potential managers and plentiful work opportunities. These conditions do not usually prevail in other developing countries where the development of managers in particular is a major problem. One long-term measure that can be taken is to introduce management courses as part of the curriculum for professions that are likely to contribute managers for the construction industry, such as engineers and architects; this would benefit the construction industry, as well as government administration and other industries.

The Small Entrepreneur

All the basic principles of general management apply also to smaller organizations. These are usually run by one man, who contracts or subcontractors out small jobs, often on a labor-only basis. However, the scope of his functions (managerial and technical) is considerably scaled down. Actions to support these entrepreneurs do not have to include training in sophisticated management techniques. Rather, the entrepreneurs can be given practical, all-round, on-the-job training in technical and administrative skills at a level that can be equated with that of a foreman in a larger enterprise.

An example of such type of assistance can be found in Swaziland. In 1975, the government established the Small-scale Enterprises Development Company (SEDCO), which received funds from several bilateral aid institutions to assist building contractors through registration, general
orientation, financial help, and on-the-job coaching. By 1978, 21 contractors were registered with SEDCO and 29 others had applied for registration. The average annual turnover of eight SEDCO-assisted contractors had reached $150,000 per firm.

In Botswana, the Botswana Enterprises Development Unit (BEDU) was established in 1973, also with bilateral assistance. It provides technical and financial assistance to small building contractors and manufacturers of bricks, cement blocks, joinery, and steel furniture. It makes available on-the-job training and workshop areas in which the small entrepreneurs can start work; it also provides assistance for the purchase of materials, tools, and small equipment, and in the marketing of products.

These programs are particularly important, given the lack of entrepreneurial tradition in these countries. Initial results have been encouraging, thanks largely to the support provided by the governments concerned. However, further development of small enterprises will, out of necessity, be a slow process. In Swaziland and Botswana, efforts have also been made to expand into the area of civil engineering construction, but results have been modest, mainly because of the lack of continuity of demand.

Representative Institutions

When the lack of adequate company management is widespread in the private construction sector, it also shows up as institutional weakness of the industry. As managers are excessively preoccupied with their day-to-day technical functions, they do not realize the importance of forming a strong trade association which can speak with authority on matters affecting the industry's business environment; which can liaise effectively with its clients, suppliers, and labor unions; and can provide services (such as statistical information and personnel training) which are best organized through a collegiate institution.

The Peruvian Chamber of Construction (CAPECO) is a good example of a well-established and respected trade association. It has assisted in overcoming the trend to apply one-sided contracts for public works construction; it did this by collaborating in the preparation of standard conditions which include the accrual of interest on delayed contract payments. Its officers also participate actively in national fora on economic development and other matters affecting the industry's market. It is a recognized source for information on pricing, among other things, and it collaborates with the government and trade unions in the running of a vocational training institution established for the construction industry. CAPECO's success stems from the quality of the contributions made by
managers of individual firms and its cooperative, rather than a confrontational approach with the government in dealing with problems concerning the country and the construction industry. To a large extent, the presence of good managers in the Peruvian construction industry is due to the fact that, professionally and socially, construction is held in as high a standing as consultancy, architecture, and other professional careers.
Personnel Development

Shortage of engineers, surveyors, estimators, foremen, equipment operators, and other skilled workers hampers the ability to do a large volume of work to acceptable standards of workmanship. Important opportunities exist for the Bank and governments to assist the construction industry in overcoming widespread deficiencies.

Problems of Personnel Development

The shortage of indigenous technical personnel is particularly acute in poorer countries, especially in Sub-Saharan Africa. It may take more than a generation to overcome inadequacies of the educational system arising out of cultural barriers. Lesotho is a case in point; its Labor Construction Unit was given a high national priority to serve as an instrument of development and as a source of gainful employment. By the end of 1981, after four years of operation, it still lacked permanent indigenous managers and, out of twenty-six positions for technical officers (work supervisors), only eight had been filled.

Even those countries that had established a cadre of construction workers were threatened by migration of skilled workers to richer markets. This phenomenon intensified in the 1970s, when the boom in oil prices created huge surpluses in oil-rich countries. In many countries of Asia and northeast Africa, skilled workers migrated to Saudi Arabia, Kuwait, and other oil-producing countries. In South America, Colombian skilled construction workers sought higher wages in oil-abundant Venezuela. While such migrations often brought considerable benefits to the economy of the labor-exporting countries, their construction industries sometimes suffered severely. In the longer term, however, these countries may gain as overseas demand tails off and emigrants return home with new or improved skills.

The mobility of construction personnel has an effect within the industry of each country: skilled men trained by public organizations are constantly being hired by the private sector. Rural labor gravitates seasonally toward urban centers of investment activity in search of off-season, unskilled construction jobs. In Thailand, for instance, farmers seek to complement their farm income in the main growing season with urban employment after the harvest—sometimes travelling over long distances to do so. Both these
forms of internal mobility bring about relatively high turnovers of personnel, seasonal shortages, and the need to train or retrain people continuously.

The seasonal availability of construction personnel affects labor-intensive construction in rural areas more because it requires seasonal retraining of people and also because it introduces fluctuation in the supply of the main construction resource. In Honduras, for instance, the availability of rural labor for a road-construction project shrank by almost 50 percent during sowing and cropping and by 30 percent to 40 percent during field preparation, weeding, and other agricultural activities. However, since investment in capital equipment in labor-intensive construction is relatively minor, the effect of the variability of labor supply on the return on industrial capital is equally minor.

For many rural households, seasonal employment in construction helps stabilize and augment incomes. This complementarity of rural construction with agriculture points to the necessity of taking into account the labor demands of agricultural seasons while planning labor-intensive construction. However, this may not always be possible. For instance, in some tropical areas, labor demand for construction may coincide with agricultural demands, all during the relatively short dry seasons.

The general education levels in a country can be an important factor in determining what skills need to be developed first. In Haiti, for example, where the adult literacy rate is only 23 percent, the principal deficiency is clearly basic education. Many foremen cannot read or write; they can hardly be expected to take charge of construction work which requires interpreting simple engineering documents. The training curriculum for skilled construction workers in Haiti must, therefore, differ from that used in Sri Lanka where the adult literacy rate is 78 percent. Currently, the Bank is supporting a project in the domestic construction industry aimed at training about 30,000 Sri Lankans within three years.

The shortage of construction work as a training medium is a restricting factor for developing domestic cadres during slack times. In two recent cases, involving countries in the Caribbean and in East Asia, proposals presented by consultants for on-the-job training for construction personnel had to be postponed for lack of suitable construction sites.

The range of skills required for three typical construction operations is shown in Table 6. A mason employed in the construction of a gravel road is expected to build simple structures, retaining walls, culverts, and small bridges. The technical demands of the job are moderate. At the other end of the scale, a mason working in the construction of a large and complex power station has to read detailed engineering drawings and finish work to exacting tolerances. Foremen and engineers are also expected to perform progressively more demanding tasks as the complexity of the job increases.
Table 6. The Range of Skills Required for Three Typical Construction Operations.

<table>
<thead>
<tr>
<th>Personnel level</th>
<th>Labor-intensive gravel road construction</th>
<th>Building construction</th>
<th>Hydro power scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled labor</td>
<td>Masons; operators or mechanics; mechanics.</td>
<td>Masons; carpenters; plumbers; joiners.</td>
<td>Masons; electricians; plumbers; electricians; plumbers; mechanics; equipment mechanics; electricians.</td>
</tr>
<tr>
<td>Technical personnel</td>
<td>Foremen; engineers (double up as surveyors and managers); pay clerks.</td>
<td>Foremen; cost accountants (estimator, or quantity surveyor); construction engineer.</td>
<td>Specialist foremen; general foremen; pay clerks; cost accountants; estimators; surveyors; structural engineers; electrical engineers; mechanical engineers; construction engineers; geologists; draughtsmen; laboratory technicians; inspectors; equipment superintendents; service superintendents; camp superintendents.</td>
</tr>
<tr>
<td>Management personnel</td>
<td>Engineers (doubling up for technical function).</td>
<td>Engineer or architect (usually doubling up for technical function).</td>
<td>Project manager; administration manager; general manager.</td>
</tr>
</tbody>
</table>
The level of skills required for construction also depends on the degree of development of a country and complexity of the work the domestic construction industry is expected to perform. Initially, the domestic industry concentrates on the construction of gravel roads and small buildings, so the skills required are limited to simple tasks, often not requiring literacy. At this stage, the higher-level skills that are necessary for the more demanding jobs usually are imported, since the frequency and volume of such jobs do not justify the creation of special training facilities. Some countries' immigration policies almost completely ban all foreign labor. Such policies can be counter-productive, especially when persons of higher or special skills will train nationals.

Training Construction Personnel

Public works departments, particularly their maintenance and workshop establishments, are a traditional source for tapping trained personnel. Some highways departments have established Training Production Units (TPUs) for road construction and equipment repair and maintenance. TPUs operate as semi-autonomous force account units, completing work while training personnel; they have been successful in Zaire (where TPUs were established out of funds provided by the United States Agency for International Development) and in Brazil and the Dominican Republic (where TPUs are included in four current Bank projects). Again, the key to their success is on-the-job training.

Large contractors, and some of their associations, also train skilled personnel: an example is the Construction Industry Training Center (ICIC) run by the Chamber of Construction of Mexico. ICIC is an independent, industry-financed organization, which was set up to provide contractors with an industry-wide facility for training construction personnel in compliance with Mexican laws. The laws require employers to provide a minimum level of training. ICIC exceeds those minimum requirements. The Center, and the Mexican employment laws which inspired it, offer an excellent example of experience which can be replicated in other countries. The Construction Industry Association of Korea runs a similar program; its special training institute operates national and regional facilities, which support and complement the training programs of individual contractors.

A very useful starting point for training civil engineering construction personnel is frequently an army engineering unit. Conscripts are first given basic education and then trained in technical skills. Training options may later include the operation of equipment and other construction trades. Non-commissioned officers are trained to become foremen and technicians;
officers become engineers, surveyors, and administrators. The training in the engineering corps is practical; it includes, for instance, building roads in difficult terrain. The Republic of Korea once again is an example of a country where military training of conscripts has helped create a literate, disciplined, and competent work force; it was, indeed, one of the important factors contributing to Korean success in exporting its construction services.

In building construction, the training of tradesmen usually begins with an apprenticeship. Institutionalized trade apprenticeships, which have operated very well in developed countries, are now being adopted more generally in the developing world. For example, efforts are being made in Sri Lanka, with assistance from the Bank, to strengthen the National Apprenticeship Board.

The graduality of learning through constant practice is essential in a good apprenticeship system. In addition, an apprenticeship should normally be complemented with academic training in skills that are regarded as necessary to read and interpret modern construction documents, and in the basic management skills for potential foremen. Apprenticeships should follow high standards to avoid their becoming sources of cheap semiskilled labor. They should, preferably, be run and financed directly by the industry with the collaboration of the state and the unions. Employers can be required to contribute to the training fund by paying a percentage of the payroll on the invoices.

Foremen rise from the ranks as they demonstrate leadership qualities at work; they can complement their practical knowledge as first-line managers with training in technical and contract administration after they qualify. Other technical personnel (such as surveyors, draftsmen, estimators, accountants, and engineers) follow a reverse course: they enter the industry after their academic training in technical schools or universities and acquire the necessary experience on site. In both cases (as, indeed, for all professional and trade formation in the industry), the essential ingredient is practical training on-the-job. This is the principal reason training is normally so successful in the military, public works departments, and larger contractors.

The Role of Government in Training

The training needs of government and of manufacturing and service industries are usually attended to first, and the construction industry, as a rule, lacks specialized training facilities. The construction industry is expected to look after its own training needs; indeed, this occurs in the more developed countries.
However, in countries where the industry is in its infancy, the organization which is essential to set up, fund, and operate a training system is usually lacking. Government support to establish such a facility therefore becomes necessary. In time, as the construction industry matures, government should hand over the training function to the industry itself. Depending on education levels and on the development of the industry, the initial inputs from the government will vary: from total involvement in organizing, funding, and running a training facility to encouraging and assisting the industry to form its own training system, for instance, with limited technical and financial assistance. The training program being run in Sri Lanka is an example of the former type of action; in Colombia, of the latter.

Training for Labor-Intensive Construction

The principal constraint being experienced in the dissemination of appropriate technology for construction is the lack of technical personnel who are willing to commit themselves to labor-intensive technology and to work in remote parts of the countryside. This is particularly true for professional engineers, who are often in short supply in those countries where labor-intensive work is economically viable and socially desirable. As engineers spend a significant part of their lives training in modern technology, they are reluctant to apply the less sophisticated, labor-intensive methods in construction. There are exceptions, of course. Mexico, for instance, has given support at the highest level of government to work in labor-intensive construction, thereby giving it significance as a professional pursuit and attracting an elite of young engineers.

In countries where engineers are scarce, there should be less emphasis on conditioning engineers to labor-intensive construction. Instead, the drive should be to promote foremen and surveyors to positions of leadership in labor construction units (equivalent in rank to—say—positions held by junior engineers); this would open up career paths and would attract more people to the job.

Evidence from Honduras, for example, showed that initial attempts to staff the labor-intensive road construction unit with experienced engineers produced meager results. At later stages, recruitment was carried out more successfully from among technicians and engineering undergraduates, who were attracted to functions which carried engineering kudos. As a result, a small band of enthusiastic and dedicated field officers, which included women, was established. In the rural access road program in Kenya, many of the supervisory positions are held by international volunteers who do not have formal engineering training. In remote places of Peru, labor-intensive
construction is often supervised by quasiprofessionals who have acquired the few engineering tools needed for this activity through work as surveyors or construction foremen.

The training required by those in charge of labor-intensive construction is mostly of a practical nature including, for example, rudiments of surveying with the use of simple surveying instruments; the recognition of appropriate sources of gravel; placing and compaction techniques; the use of hand tools; and elements of accountancy, payrolls, purchases, cost control, and reporting. The training should be given on-the-job to carefully selected natural leaders who have at least secondary education.

WAGE POLICIES AND PRODUCTIVITY. The use of a system of rewards to motivate people to learn and improve on their work or trade is an important factor in the development of a competent labor force. Inadequate rewards, coupled with indifferent supervision, can result in apathy, poor productivity, and slow development of skills.

The productivity of a worker will be high if he or she can take home what is recognized as a better-than-average paypacket, earned in exchange for performing an agreed task. In the Dominican Republic, for example, the introduction of task (or piece) work in a rural road construction program helped overcome recruitment and productivity problems; the laborers were earlier paid a legal minimum wage regardless of what they produced. When they were paid on the basis of the tasks performed, the workers earned more than the set minimum and the program benefited from improvements in productivity.

However, it is often impractical to motivate labor through such task work. In some countries, unions oppose the principle of competitiveness which it entails; their intervention, for example, by fixing low production ceilings or productivity standards, can negate the advantages. Elsewhere, the system has been abused by employers and its use has become politically embarrassing. In some cases, experienced supervision may not be available to cope with the extra load of measuring the tasks done.

Generally, construction work rewarded on a time basis is less productive. When all workers are compensated equally, regardless of individual competence, standards can be expected to be low. Workers deprived of the incentive based on individual productivity will become more preoccupied with the completion of the construction contract, the opportunities for continued employment, or the ordeal of finding a new construction site, even if work is generally abundant. Given the particular employment conditions in construction, such preoccupation can affect productivity and the improvement of personnel. It can be overcome, for instance, by carefully
scheduling the movement of personnel when opening new sites, coupled with an active communication program, or by giving production bonuses to teams. These incentives are generally acceptable and motivate individuals through peer pressure. Bonuses, however, if used over prolonged periods, in situations where there is no competition among teams, may also lose their effect.

Training and wage policies are not the only factors affecting personnel development. The work environment, safety, nutritional levels of workers, quality of leadership, the unions, and so on, also have an effect. However, these factors cannot be examined in isolation from those of management issues and are less likely to be influenced by actions of governments and the Bank than training and wage policies.
Unlike manufacturing and the utility industries, construction does not operate at a fixed location, nor does it require a substantial edifice from which to operate. In the manner of an itinerant laborer, it moves from site to site wherever work is available. As a rule, contractors have a modest office building and a plant yard, located on cheap industrial land. Their principal physical asset is equipment, which moves with the site of work, is subject to rough treatment, and has a useful life of just five to seven years. These assets provide a narrow collateral base; when examined together with other problems, such as weak management, one-sided contracts, delayed payments, and the risks involved in construction, these factors weaken the case of the industry when it searches for finance.

Financial Consequences of Risks

Construction entrepreneurs must face a daunting array of risks. Fluctuation in demand heads the list. It is a risk over which the industry has very little control and affects construction more intensely than other sectors of the economy. One way of handling this problem is to accumulate surpluses and to invest them wisely during periods of abundance; the other is to diversify the activities of the enterprise.

There are three types of risks which the industry can assess and manage; they include:

- **Inherent risks.** These arise from the assumptions made at the time of bidding: among them, work organization, labor and equipment productivity, procurement and expediting of materials, and weather conditions. The ability to handle these risks depends on the experience of the manager and the estimator, the adequacy of cost control and feedback, and the quality of the information available on the site and other local conditions.

- **Insurable risks.** Damage to property, health and life of employees, third party liability, and certain commercial risks are included in this category. Policies such as Contractors' All Risks cover most of these risks.

- **Transferable risks.** These are conveyed to others by contractual arrangement. For instance, some production and consequential risks can be transferred to subcontractors, suppliers, and transporters.
There are other risks which the industry should not be expected to bear, since they fall beyond the control of the construction entrepreneur. They include delays in the availability of the site and in contract payments, inflation, and civil disturbances which are not considered *force majeure*. Their financial significance can only be guessed and, in a fair contract, they should be borne by the owner.

**Funding Requirements.** The requirement of funds will be determined by the specialization of the contractor and the technology employed:

- **Building construction.** This type of construction makes intensive use of labor and materials; equipment costs rarely exceed 15 percent. Its main requirements are for short-term working capital. Long-term mortgage or leaseback capital becomes essential only when building is linked to speculative development.

- **Labor-intensive civil construction.** Short-term working capital is required to cover wages and salaries, which account for over 50 percent of overall costs. When material and tool purchases, equipment running costs, and overhead are added to wages, they may total 80 percent to 90 percent of overall cost.

- **Equipment-intensive civil construction.** Wages, salaries, material purchases, equipment running costs, and overhead still amount to 40 percent to 60 percent of costs; they require short-term working capital. However, capital costs for equipment become an important item (they may account for up to 60 percent of overall costs); they demand special medium-term funding.

In the initial stages of mobilization, the cashflow characteristics of each group are also different. Whereas the initial expenses of building and labor-intensive civil construction are modest, those of equipment-intensive civil construction are not. The latter require a considerable amount of cash, largely for the purchase of equipment. If new equipment must be imported, for example, domestic contractors are often required to pay between 50 percent and 60 percent of its free-on-board value before possession; they are also required to make a down payment and to pay customs duties and other transportation- and importation-related expenses.

After the initial payments, the cashflow for an uneventful construction operation follows a generally smooth trend, along what is known as an “S” curve, serrated by fast drawdowns (when meeting payrolls and supplier bills) and equally fast inflows from collections. Herein lies one of the big risks in construction: if bridging funds are not readily available, a gap in collections can be disastrous.
The mobilization for exporting construction services places particularly strenuous financial burdens on contractors who are seeking to diversify their markets. The collection of contract money in the export business can also present problems. Industrialized nations have covered their exporters with some form of credit insurance for quite some time. In the developing world, the example has been followed by the Government of the Republic of Korea, which guarantees payments to eligible exporting contractors (up to 720 percent of their capital) and finances up to 75 percent of the foreign-exchange costs.

Sources of Finance

The Client. Clients in general, and governments in particular, can have a direct influence on contractors' finances in two areas: advance payments and regular payment procedures. Advance payments must be suited to the type of construction and to the technology used. They may amount to a relatively low figure of about 5 percent for building construction or labor-intensive civil construction and could reach upwards of 20 percent for civil construction that makes intensive use of equipment. In the latter case, the contractor must acquire and mobilize his equipment fleet and establish field offices, camps, repair and maintenance facilities, and so forth; in such cases, he often has to make big payments at the outset.

Advance payments in excess of 20 percent of the cost of civil works should be carefully scrutinized; there is a danger that the excess of cash at the beginning of a construction job may induce poor financial decisions, and possibly restrict the cashflow at later stages of the contract. Advance payments must be set to meet the bona fide initial cash requirements of the contractor; this should be done in a way that will enable the contractor to mobilize his resources promptly and avoid a heavy financial charge and unbalanced prices (front-end loading).

A system that provides for prompt payment of contractors' invoices is the best form of financial assistance which the industry can have. Delayed payments are an enforced and expensive form of suppliers' credit, which only produces difficulties to the client who may have to face contractual problems or pay higher costs. Prompt payments are rare in the world (Mexico and Peru have offered good examples); in such cases, it is easier for the industry to secure financing.

Commercial Banks. In many developing countries, the doors of commercial banks often are practically closed to the construction industry,
except when its loan applications are backed by real assets as collateral. Even with this backing, loans issued are often for an unusually low fraction of the worth of the collateral; contractors, therefore, frequently borrow from nonbanking sources paying considerable premia over commercial rates.

Colombia is a case in point. Prior to 1980, monthly payments by the government to contractors were being delayed by up to eight months; banks discounted a maximum of 60 percent of the value of the payment certificates; and contractors took recourse to the nonbanking money market at interest rates up to twice the commercial bank rate. The situation was considerably eased when the Ministry of Public Works and Transportation (MOPT) improved its payment procedures, bringing down to less than one month the interval between certification and payment. Nevertheless, further financial assistance will be required. MOPT is commissioning a study of a financial support system for the industry. This study complements the program for training the owners and managers of construction companies in enterprise management.

Reducing the uncertainty of cashflow in the industry will certainly improve its access to regular financing from commercial banks. Equally important in the bankers' perception of risk (and hence, their readiness to assist) are the general conditions of contract, the administration of projects, and the quality of management. Long-term benefits for the industry and the government can also be obtained by channelling external aid aimed at developing the construction industry through commercial banks; this can foster permanent business links between the commercial banks and contractors.

DEVELOPMENT FINANCE COMPANIES (DFCs). These financial intermediaries provide another avenue for channelling external assistance to the construction industry. Several Bank projects have made special provisions for onlending funds to contractors through local DFCs; these have included credits for highways in Ethiopia, Ghana, Nepal, and Pakistan. Recent DFC projects in industrial development have also included domestic construction industries as potential borrowers; this trend should be encouraged.

However, many DFCs do not have personnel experienced in assessing construction enterprises as potential borrowers; this has been experienced even in the more advanced of the developing countries. Loans to DFCs for onlending to the construction industry should be accompanied by technical assistance to establish the system and the staff necessary for evaluating contractors' creditworthiness. The characteristics of the construction industry require that a special management and organization assessment be carried out, together with the usual financial analysis. There are no set rules for this
appraisal; it largely depends on the judgment of an experienced evaluator. Until such experience is available, the staff of the DFC should continue to obtain external technical assistance. For example, a Bank loan to the Industrial Development Bank of Pakistan (IDBP) for onlending to contractors, was appropriately coupled with technical assistance (financed separately by the United Nations Development Programme) for the appraisal of individual loans.

The ideal situation, where contractors meet all financial and management criteria, is rarely found. To achieve long-term success, loans to less experienced contractors must often be associated with technical assistance to help them overcome their management and technical shortcomings. Government departments employing these contractors should also support them in their formative period; this can be done by providing experienced technical supervisors who are capable of guiding the contractors through the pitfalls of contract management. Highway construction supervision associated with the IDBP loan lacked this complementary feature, and this may jeopardize its long-term effects.

SPECIAL INSTITUTIONS. Some countries have established banks especially dedicated to the financing of construction works and the construction industry. For example, the Banco Nacional de Obras y Servicios Públicos (BANOBRAS) of Mexico finances a wide range of activities; of these, the construction of public works and low-cost housing are possibly the most important. The bank is government-owned, but exercises a high degree of independence.

BANOBRAS, since its inception in 1933, has had the capability of issuing mortgage bonds and borrowing from international sources. It has, undoubtedly, helped the Mexican construction industry become one of the more developed in the world. One essential feature of BANOBRAS' support to the industry has been its provision of short-term loans to public works contractors: funds are advanced against the security of an assignment of the contractors’ receivables from the government agency sponsoring the project. In this way, the uncertainty and effort of collection are removed from the contractor. As part of its trust activities, BANOBRAS also operates a special fund that can provide up to 25 percent of the full value of a project; this is used to finance the start-up costs of construction by public works contractors.

By contrast, an institution set up in an African country for developing the domestic construction industry by making loans to indigenous contractors has failed to produce positive results to date. Lack of entrepreneurial vocation and management ability among the country's indigenous population partly explain the failure. Also, the institution was set up with insufficient
resources to manage all the functions involved in developing the industry, let alone the banking function. In this instance, it would have been preferable to use the existing channels of commercial or development banking, rather than starting a new financial agency; this preference should hold where the volume of work which made possible the Mexican bank is not available. The existing banking channels can, of course, be provided with technical assistance, to help them appraise construction enterprises correctly.

The Small, Labor-Intensive Contractor

In building and in labor-intensive civil construction, cash requirements are immediate and pressing. Weekly payrolls must be met promptly. Unlike materials and equipment, for which supplier credit can be available, payrolls must be funded by opportune cashflow, or through short-term financing. However, since financial institutions rarely are open to smaller entrepreneurs, frequent and regular payments by the client become an essential requirement for small labor-intensive contractors to operate.

Problems of government cashflow have also affected force account labor-intensive construction work. In a Caribbean country, for example, payroll cash was often delayed by several weeks; this resulted in mistrust by the workers and created difficulties in recruiting and retaining labor.

When employing small labor-intensive contractors, or when carrying out this type of work on force account, clients must set up a mechanism which will ensure unhindered, opportune payment of payrolls. The system that is usually preferred is a revolving fund run by the department directly concerned with supervision. From this fund, frequent payments can be made on a system of advances based on estimates of production, or on the number of workers at the construction site, and later payments can be adjusted as measurements of work performed. In building construction, clients can assist small entrepreneurs by buying the materials, storing them, and releasing them as they become necessary for construction; they can be discounted from the contractor's statements, as they are incorporated in the permanent works. Such a system operates successfully in Bangladesh, together with the hire of any equipment necessary. Hire charges are also deducted from the contractor's invoices.

Initial advances on contracts are also essential to buy tools, scaffolding, and some items of equipment; to mobilize and set up camps; and to finance some labor costs while the system for regular payments gets established. Smaller contractors may not have access to bondsmen for those advances, nor to guarantors for their performance. Clients, of course, may have to face added risks, derived from the lack of financial strength or experience of the
small entrepreneurs. However, the risk of potential losses can be reduced by maintaining competent supervisors on site who are capable of closely monitoring the work and of providing technical assistance (including financial advice) when required.

Equipment Acquisition

The acquisition of equipment is the most important financial concern of civil engineering contractors. In well-developed markets, the usual form of financing is through arrangements made by the supplier, who is normally an intermediary for a commercial bank. It follows that, in markets where commercial banks have difficulties in lending directly to the industry, these difficulties will restrict the availability of supplier credit, unless the supplier guarantees the deal.

In some countries, contractors have been assisted in setting up business by generous construction and maintenance contracts which allow for the build-up of a surplus on which to base capitalization and growth. Contractors have also been assisted by governments making available used equipment at book value. Some contractors may also buy their first equipment second-hand from larger contractors. In countries where labor is cheap and good mechanics are available, these are ways in which small firms can acquire construction equipment.

Other methods are being used to help contractors get started in heavy construction in countries short of capital; they include direct loans channelled through commercial banks and development finance companies and the establishment of companies that lease and hire equipment. Financial leasing is a useful avenue for the acquisition of equipment, particularly for civil works contractors. In such cases, big down payments usually are not required; monthly installments are tax-deductible as a business expense, and the leases include an option to purchase the equipment upon completion of the lease period (usually 3 or 4 years). The lessor retains ownership of the equipment and can easily repossess in case of financial difficulties of the contractor. The International Financial Corporation (IFC) has taken an interest in leasing companies and has participated in the equity of several of them. By the end of 1981, construction equipment represented, on the average, 13 percent of the business of the financial leasing operations fostered by the IFC; in two countries, Uruguay and Sri Lanka, it had exceeded 20 percent. It is an area of potential growth, particularly in assisting smaller contractors.

Straight hire is usually applied for equipment which the contractor requires only for short periods. Commercial hiring of heavy equipment for
civil construction can be very costly; idle periods of an expensive inventory will be reflected in the hire rates and the user’s lack of concern with care or maintenance of the equipment can result in rapid deterioration. A financial lease, by contrast, usually includes a purchase option which induces the contractor to look after the equipment.

One method of commercial equipment hire that is frequently used takes the form of a subcontract: the supplier rents the equipment with the operator and provides fuel, lubricants, and service. This system is used in countries as diverse as Kenya and Peru, where smaller domestic companies rent equipment to larger contractors. Large foreign contractors use this method of hiring to get started on larger jobs and frequently to run the whole contract, particularly in areas of high risk. This system assists the smaller firms to acquire the equipment with a prospect of steady use over the contract period; they also benefit from the introduction of equipment management practices by the larger main contractors.

A straight-hire system from an equipment rental company to a small contractor is not a means for capital formation; its only advantages are those of being a tax-deductible operation expense, and involving the contractor only in a short-term obligation. This arrangement differs from financial leasing or hire-purchase in which monthly installments count towards the purchase of the equipment.

One further possibility for making equipment available to smaller contractors is for the government department concerned to provide it on hire. The system does not work well in cases where the contractor cannot exercise full control over the operators and over repairs of the equipment. The system applied in the State of Bihar, India, has overcome this difficulty. The contractors pay the operators directly; they also pay for all operating expenses and carry out minor and even major repairs through commercial firms (if the government fails to carry them out), deducting the cost of repairs from the rentals due to government. This example is worth following elsewhere, particularly in cases where large fleets of government equipment lie idle while, at the same time, contractors lack the capital needed to acquire equipment.

Bonds and Guarantees

Bonds and guarantees are normally written by banks, financing houses, and insurance companies; they can also be established through a cash deposit made by the contractor, or through deductions made from his regular payment certificates. They serve to assure the client of the contractor’s performance. Bid bonds, for example, ensure that the contractor will stand
by his price or forfeit the bond; the same is true for contract performance bonds and maintenance guarantees. Bonds and guarantees further compromise the same sources of collateral which the contractor uses for funding and so are a particularly difficult problem for the small contractor.

Nevertheless, guarantees are a form of insurance cover for the owner and are essential in construction contracts. In special cases, particularly for small contracts linked to the development of an infant construction industry, the contracting authority, instead of requiring a performance surety, should consider retaining a portion of the progress payments, carefully structured so as not to hamper initial cash requirements. The initial risk would thus be shared between the client and the contractor and any net costs derived from contractors' defaults would have to be written off as part of the cost of developing a domestic industry.

In a more complex environment, it may be possible to establish a central clearing house for "construction paper," linked to the commercial banking system; this can be done in a way which would redistribute risk and financial exposure, possibly through the establishment of a fiduciary role in contracts for public and private construction. This role can be similar to that of BANOBRAS in Mexico. The IFC is doing some pioneering work in this area by assisting in the establishment of a guarantee facility for bonding Turkish contractors working abroad. A consortium of Turkish commercial banks is being formed for the purpose and IFC will participate in the syndicate. The facility should provide bid bonds, advance payment guarantees, and performance bonds, as well as guarantee local overdrafts, to prequalified exporting contractors.
Physical Resources

Materials and machinery, the main physical resources used in construction, are largely acquired from sources outside the industry. Difficulties in their supply may be caused, for example, by shortages of foreign currency, transportation and importation problems, and protection of inefficient local manufacturers. They can seriously affect the efficiency or even the continued viability of a domestic construction industry. In addition, lack of working space—for example, if the client fails to acquire the work site in time for the contractor to start work—can cause delays and the resulting costs may not always be fully recovered by the contractor.

Materials

The timely availability of construction materials, of a suitable volume and quality, is essential. Shortages of manufactured materials can be most serious when they affect basic structural work. While construction work can normally proceed by using substitutes for finishing materials, the lack of fuel, aggregate, timber, cement, steel, and asphalt can have an immediate paralyzing effect. Long-term solutions to these shortages need to be carefully studied in relation to the size of the market, the availability of raw materials, the energy demand for processing, the cost and economic implications of local manufacture, the availability of foreign currency for imports, and the substitution by local materials through changes in technology.

The domestic manufacture or substitution of cement is particularly important in landlocked countries. Rwanda and Burundi import cement through Mombasa and Dar-es-Salaam; this requires, in addition to transportation by sea, about 1,600 kilometers of transport overland, which increases costs considerably and introduces uncertainties of supply if there are any changes in the regional political situation. Supplies have been periodically interrupted in the past, causing delays in construction and cost overruns. To resolve the problem, Rwanda is planning to commission a small cement factory, while in Burundi studies are underway, as part of a construction industry project funded by the Bank, to increase the use of lime and bricks as a means of reducing the demand for cement in building construction.

State or private enterprises that monopolize the manufacture, importation, or marketing of basic materials can also affect construction. For instance, if
there is only one rolling mill in the country supplying reinforcing steel, a
sudden increase in demand caused by the construction of a large structure can
totally disrupt reserves and rolling schedules for particular sizes. Monopolies
usually are assured of protected markets and the absence of competition
invariably leads to complacency; both these factors can result in high costs
and, often, poor quality. There is no easy answer to this problem, since
lifting all import barriers could lead to dumping of goods and, potentially,
the disappearance of local strategic industries. A good compromise would be
to allow imports at realistic prices to stimulate efficiency in local production
as well as to counter cyclical shortages of essential materials.

Building construction often sustains a sizable market on which support
industries can be developed. These industries normally require little capital,
but offer high potential for generating employment. The manufacture of
building materials like tiles, fiberboards, pipes, paints, doors, and windows
is, therefore, normally given a priority in developing countries. But
“priority” at times, is mistaken for “protectionism,” which creates problems
for the construction industry. In Trinidad and Tobago, for instance, the
protection given to local manufacturers of about 40 types of building
materials led to high prices and insufficient supplies. To solve this problem,
the government set up in 1977 a Working Committee on Construction
Materials. The committee recommended that import restrictions be
abolished, that duty-free importation of certain materials be permitted, and
price controls be imposed on materials whose shortage had resulted in undue
escalation in prices.

The importation of materials is often hampered by cumbersome
bureaucratic procedures that frequently give rise to contraband and
corruption and restrict the flow of materials. Although the solution to this
specific problem lies outside the scope of this paper, its importance to
construction, for the supply of both materials and spare parts, needs to be
stressed.

Building construction, particularly of low-cost housing and small-scale
community facilities in remote areas, often offers opportunities for the use of
traditional building materials (such as adobe or banco, and thatching). These
materials can lead to considerable savings over imported technology and,
when improved, can enhance the durability and habitability of the buildings.
To overcome any skepticism or prejudice against the use of the improved
materials, and to disseminate their use among foreign-trained engineers and
architects, it may be necessary to demonstrate their use in pilot projects.

The shortage of materials won from nature, for direct processing and
incorporation in construction, can also pose problems. These materials often
constitute the bulk of construction and can be substituted only with
difficulty; they include concrete aggregates, gravel, water, timber, and clay for making bricks and for using them in the core of earth dams. The lack of gravel in the tropical flood plains associated with large rivers, such as the Amazon, illustrates the point.

Where water is scarce, the solution prescribed has been to adopt "dry" construction, using timber, metal, or asphalt. Where large, durable blocks of rock are difficult to obtain, reinforced concrete interlocking blocks are used to build breakwaters. In desert areas, where clays are not abundant, bricks are made from sand and quicklime. In mountainous areas, the traditional clay cores of earth and rock-filled dams have been replaced by a wide range of ingenious diaphragms, using steel, concrete, and asphalt.

In the supply of materials, opportunities for substitutions often do exist. Therefore, an adjustment in the basic technology used in the design may widen the choice of materials that can be used often and achieve comparable quality and durability at lower cost or higher savings in foreign exchange. For substitutes to become available, the options for substitution must be made known. This is possible if wide-ranging field investigations are carried out; they could include geological and soils mapping, testing, and experimentation with materials. The Transport and Road Research Laboratory of the United Kingdom, for example, has carried out and published thorough surveys of roadmaking materials, in places as diverse as the Caribbean, Ethiopia, Nigeria, and Malaysia.

The quarrying and supply of basic raw materials is often a good starting point for local entrepreneurs to join the construction industry. In Ghana, domestic quarry owners were assisted financially and technically by the government under two Bank-financed highway projects; in Kenya, domestic entrepreneurs have been assisted by the government to become, in the first instance, suppliers of gravel for road maintenance. In such efforts, as in other areas affecting the construction industry, a supportive environment is essential: material manufacturing and processing equipment is costly, depreciation periods are correspondingly long, and to justify the establishment of an industry an adequate market and stability must be provided.

Equipment and Tools

Equipment and tools pose challenges that are similar to those of manufactured construction materials; they center on the freedom of choice the construction enterprise has and on the flow of spare parts through the customs. The availability of credit is the other important issue; this has been discussed in the previous chapter.
Standardization of equipment is, as a rule, desirable. However, in practice it is difficult to achieve: this is because of relative fluctuations in price, which make it difficult to reconcile the advantages of standardization with possible savings on price. The choice of nonstandard equipment can also be influenced by attractive financial conditions tied to a particular make. These problems apply more widely in the public sector, but can also be found in the contracting industry, particularly among smaller firms with limited capital resources.

There is no easy answer to this problem: those responsible for procurement of equipment should carefully weigh price advantages against the capability of the equipment being offered to carry out the required job, its serviceability, the availability of spare parts and service, its compatibility with the existing fleet, operation and maintenance costs, and so forth. Careful records of actual experience with various makes should be the strongest argument with which to decide procurement decisions, particularly on standardization.

Procurement based on political or protectionist considerations is another problem. Very frequently, contractors are obliged to buy locally produced equipment, vehicles, and tools, even if they are not specifically suited for their work. Construction equipment must be tough and reliable and have an assured supply of spare parts to ensure continuity of operations and cost efficiency.

Delays in getting spare parts can at times render equipment idle; this problem applies to all sectors of the industry. Basically, this problem is one of hampered flow and can normally be traced to customs procedures. In one South American country, customs procedures have been so cumbersome that they have led to a thriving contraband business.

As costs of construction equipment are high, and the funds available to the industry for purchases difficult to find, it is extremely important that the equipment should be kept running. Together with the availability of capable, experienced mechanics, an assured supply of spare parts is essential. Many countries, because of a relatively small demand for spares, cannot afford to keep a complete stock to suit all models and types of construction equipment. This problem is frequently compounded by lack of standardization. However, most manufacturers of well-known construction equipment have large spare parts warehouses in places like Miami, London, Paris, and Singapore, only a few hours' flight away from countries in Latin America, Africa, and Asia. Streamlining customs procedures would enable equipment owners to draw from those warehouses to avoid keeping costly local inventories as well as to reduce the loss of productive time of capital assets.
**State-Owned Enterprises**

When the government has one or more construction enterprises of its own, it tends to give them preference in the acquisition of materials, spare parts, and other resources in short supply. One notable example of such preference, recorded in West Africa, created severe difficulties for the private sector. Ethiopia, on the other hand, offers a better example: the government sets priorities for distribution of resources on the basis of the importance of the project, without regard to the ownership of the enterprise.

**Materials and Tools for the Informal Sector**

Communal and individual self-help builders usually operate with very limited capital. Because of their modest savings, they purchase tools and materials in small quantities, thereby losing advantages of bulk purchasing. In fact, very frequently these builders pay a heavy surcharge to retailers who operate near areas where informal construction is particularly active. The potential for assisting this sector being high, special attention needs to be given to the means for reducing the high cost of purchasing tools and materials; this can be done by fostering the establishment of supply mechanisms which will make goods available at competitive prices. Regulatory devices and subsidized outlets have been tried; their results are never satisfactory. A preferable course of action is to encourage groups of "selfelpers" to form neighborhood cooperatives, or work closely with nongovernmental organizations. Bulk purchase and storage can thus be organized and a focal point provided for channelling financial assistance. This mechanism operates well in some of the marginal townships in Latin America.
9

Strategies for Development

The domestic construction industry in developing member countries is important to the Bank for at least two reasons. One, it is a medium for construction or maintenance of a large majority of Bank-financed projects in almost every economic sector. Two, it is a key growth sector which on its own can contribute much to the economic development of the country. Work on Bank-financed projects often represents a significant share of the total civil works underway in a country: they can, therefore, have an important effect on this sector. With the passage of time, the Bank has become increasingly involved in the development of the domestic construction industry in its borrowing member countries, but more needs to be done to help realize its full potential.

Assessment of the Bank's Initiatives

The World Bank has been actively concerned for the last ten years with the development of the domestic construction industry. The most tangible contribution the Bank has made to date has been its emphasis on fair contract procedures in procurement under all its loans and its willingness to allow slicing and packaging of larger projects. The latter has enabled smaller local firms to participate in ICB for larger projects. Although subdividing projects places additional burdens on administration and supervision, provisions have been made increasingly for slicing and packaging of irrigation and road building projects.

Slicing and packaging has resulted in making available a new source of construction work on which many domestic firms have prospered. Problems associated with slices constructed by domestic firms have been mostly related to the size of the package, insufficiency of capital, and inadequacy of the management and technical expertise of the firm or the supervision of the client. Bearing in mind that the procedure is applied for the development of a domestic capacity, while achieving cost efficiency in construction, slicing should be preceded by a careful analysis of the capability of domestic firms. Management and technical shortfalls should be improved upon with technical assistance; other shortages, such as equipment, can be made up by providing it, for example, on hire from a government pool. Likewise, the project could also include technical assistance to train or reinforce the
supervision staff of the client, when the latter decides to perform this task directly but lacks the necessary expertise.

Another area of Bank’s assistance that is clearly visible is in labor-intensive construction projects. However, a considerable amount of work remains to be done to spread the use of labor-intensive techniques to a wider range of projects and economic sectors. Government officials have to be convinced that these methods are not retrograde. Important organizational efforts have to be made if they are to be applied efficiently. Attempts also must be made to enable the private sector to use labor-intensive techniques: to do this, distortions in factor prices will need to be corrected. In certain areas, fears of problems arising from dependence on labor need to be overcome.

The Bank has also made a considerable impact by helping in the improvement of the industry’s human resources. The Bank’s numerous education projects have included vocational training for artisans and building technicians; its urban development projects have assisted in developing skills in the informal sector and among small building entrepreneurs; and highway projects have included components for training equipment operators and mechanics. However, the improvements in procurement procedures, the development of labor-intensive technology, and training of human resources have upgraded discrete facets of the construction industry. What is needed is a strategy that has a wider scope for the organic development of the industry.

General Lessons

The need for an integrated strategy to develop the construction industry is illustrated by many well-intended but dispersed efforts which have not yielded the expected results. For example, some studies of domestic construction industries have not resulted in follow-up actions, in part because government commitment to the development of the industry has been insufficient.

In other cases, studies were inconclusive because they were launched with weak terms of reference. This resulted in the omission of important factors (particularly general management and personnel development), or exhaustive listing of problems without the formulation of properly focused action plans. Studies of the Colombia (1979) and Indonesia (1981) construction industries omitted crucial management aspects and did not produce tangible action plans.

Efforts have been made to support road building contractors by providing them funds to purchase construction equipment. But in the absence of technical assistance to improve their engineering and management proficiency, the results have been short of expectations. This was the case in
Ethiopia, where advances to contractors from three consecutive highway projects were not backed with technical assistance, particularly in management. Similar problems were experienced in Pakistan where an additional difficulty was the shortcomings in construction supervision and contract management by the departments concerned.

Frequently, technical or financial assistance for the industry is not reinforced with continuity of work opportunities for the contractors or with necessary improvements in administrative practice (to ensure the timely payment of progress certificates, for instance). In Trinidad and Tobago, after some efforts to develop the private contracting industry in the second half of the 1970s, the government established in 1980 a large parastatal organization to compete with private contractors in road construction. This parastatal has been given strong capital and technical assistance backing, which may thwart the development of the domestic, private contracting industry. Although set up as an autonomous, competitive organization—and this is a good practice—its size could seriously affect work opportunities available to the contracting industry. Elsewhere, cases have been recorded of improvements which did not last long after their introduction because they were not backed with the necessary policy reforms; these cases involve, in particular, the timely payment of progress certificates.

An important lesson learned in construction is that a good deal of specialized technical assistance is required to develop and strengthen the industry. Assistance is primarily required in the area of management. Construction industries in their infancy need to be fostered for a long period—possibly ten years or more—with supportive supervision and contract conditions that will gradually increase their perception of, and capability to manage, risk. At later stages of development, the industry may require expertise in general management. At all levels, technical assistance must be given to those who manage and supervise contracts in government departments and, possibly, also to those who are called to support the industry with loans or equipment (the DFCs, for example).

There are ample opportunities for enhancing the use of resources that are abundant locally. However, their use must be facilitated by reforms in policy and procedure which follow from a clear definition of priorities within the construction industry. For instance, a wider use of labor can be facilitated by correcting price distortions; codes of practice can also be adapted to the use of locally abundant materials.

**Strategy for Developing the Industry**

There is clearly a need to have a comprehensive strategy to support those countries that demonstrate a commitment to develop their construction
industry and request assistance for that purpose. Experience has shown that considerable effort is required over a protracted period, in providing direct assistance (for instance, through Bank loans for infrastructure, housing, and education) as well as indirect support (through reforms in policies and procedures) to improve the business environment of the industry.

In the formulation of such a strategy, the main emphasis should be on civil works: it is here that the greatest supply gaps are visible and the most difficulties arise, due to the relatively larger capital resources required and risks involved. On the other hand, many of the problems of the industry are common to both civil engineering and building construction. Poorer countries often must start by developing a basic capability in building; in the more advanced developing countries, enterprises must often diversify their activities into both civil engineering and building construction to protect themselves from fluctuations in demand from individual sectors.

In some countries, the complexity of the problems and constraints faced by the construction industry may warrant the drafting of a concise document to outline the strategy to be followed, the reforms in policy and procedure to be sought, and how these can be brought about. This document would be a valuable management tool which could be used to set objectives of the construction industry in projects taken up in various sectors. Government actions could include the introduction of policy and procedural reforms, the provision of suitable work for the nascent contracting organization, and the taking of appropriate training initiatives. The strategy document would normally need to be based on comprehensive knowledge of the industry. In some countries sufficient background has now been accumulated, so a new study will not be required; other countries may require a special study to be conducted. A framework terms of reference, which can be adjusted to individual countries, is given in Annex 1.

The strategy should be drawn in the context of the broad policy environment of the industry and should be linked with a few, well-focused action plans to deal with priority problems. It should also single out specific points, related to the policy environment of the industry, that could be dealt with in the course of regular project work. The following paragraphs discuss these issues.

*The Broad Policy Environment*

Developing a competitive construction industry should be an important objective of government policy. As a first step, governments should assign to a particular office the responsibility for promoting the development of the construction industry. Among its important tasks it would ensure that fuller
account of the industry is taken in the broader process of development planning; (particularly in the planning and phasing-in of public works investment to dampen fluctuations in construction demand), and would identify the problems and constraints of the industry and draw up a strategy to overcome them. The government department that makes most use of the industry (usually public works) should, generally, spearhead the action. In correspondence, contractors should be encouraged to set up a representative association which can serve as a channel for conducting a dialogue with the government and as an agent for taking joint action by the industry.

Considerable importance must be attached to policy reforms that are needed to facilitate the development of an efficient domestic construction industry in developing countries. Attention needs to be paid to the effects of monetary and interest rate policies on the construction market and on housing in particular; to budgeting regulations that provide multi-year contracts and allow continuity of cashflow for them; to policy and legislation that can improve general government contracting practices and contract supervision procedures; to wage and employment policies that encourage a wider use of an under-employed or unemployed labor force; and to procedures for allocating and channelling foreign exchange that is required by the construction industry, especially for the procurement of spare parts. The measures that need to be taken in several of these categories should be identified, and their implementation planned, as part of the strategy for developing the domestic construction industry.

There is also a need for continuing to reform, update, and fine-tune regulations and procedures on prequalification, bidding, contracting, payments, building standards, land acquisition and land titling, relevant customs procedures, and so forth. In essence, the approach required is one of fairness and open competition in procurement and contract administration. Regulations also need to be streamlined to ensure an uninterrupted flow of inputs and payments in the construction process.

At the macroeconomic level, effort will be required to reduce or eliminate distortions in factor prices and interferences with the supply of factors of production. The distortions include monopolistic control of the supply of major materials and insufficient or delayed allocation of foreign exchange for purchase of spare parts. In addition, attention needs to be paid to prices and controls which affect the relative use of local resources (for example, labor) over imported resources (such as equipment) and which often cause reliance on the latter more than is economically desirable. Other issues that need to be looked into include the foreign exchange rate, the import tariff regimes on equipment (especially when foreign contractors are exempt from import duties, while local firms have to pay), and regulations controlling the hiring and firing of labor and the wages and social security contributions.
Minimum wage laws and union agreements which put the cost of hiring unskilled labor for construction substantially above that in other sectors—especially agriculture in rural areas—should be reviewed to reduce or eliminate such distinctions. While these laws and agreements may protect some labor, they may do so at the expense of others who may find opportunities to participate in employment reduced. Because reforms in labor legislation are difficult and slow, there is a need in many countries for initiatives at the community, regional, and ministerial levels to develop ways to achieve a higher participation of labor in the development of infrastructure projects that benefit those communities or regions; this can be done, for example, by encouraging communities to volunteer their labor or contribute materials in projects that benefit them or their regions.

Governments should also aim to achieve a greater understanding of the potential and needs of the informal sector of construction. Considering the labor-intensive and self-help nature of informal construction work, relatively minor financial inputs coupled with strong technical assistance support can produce a considerable impact.

To develop the construction industry most of the poorer developing countries will require a dynamic and aggressive policy which is targeted on incipient contractors and which includes an array of positive assistance measures sustained over a relatively long period. In publicly owned construction operations, the aim should be to introduce the principles of commercial management, in particular the principle of accountability, as a means of curtailing inefficiency and achieving competitiveness.

Both government and industry should strive to improve and expand training for management and for technical personnel. Programs in technical and vocational education should take account of the needs of the construction industry. In many countries, special facilities for training construction personnel are needed. Where the industry is in its infancy, government usually has to take the initiative to organize, fund, and run such training facilities. But leaders of construction companies should be brought into the planning and development process from the start and increasingly made to bear part of the costs.

Practical Aspects of Strategy Implementation

The points in the preceding section refer to some of the areas of policy which could form part of a general strategy for development of the industry. The implementation of the strategy should follow a two-pronged approach: first, the execution of priority, action plans to deal with the most pressing problems and constraints of the industry; and second, the introduction of
policy and procedure measures through the process of planning and implementation of construction and maintenance work to help improve the business environment for domestic construction industries. The most significant areas for regular action by all sectors which make use of construction services include:

- The existence of fair procedures for competitive bidding for construction work.
- The use of fair conditions of contract, based on the equitable determination of the rights and obligations of the two contracting parties. The contract should include special provisions for compensation to the contractor for any delays in implementing the project induced by the client; the accrual of interest for delays in contract payments; and a suitable mechanism for price adjustment in prices based on escalation of costs (including the maintenance and regular updating of suitable indices).
- The streamlining of customs and importation procedures, to facilitate the purchase of spare parts and materials.

The specific action plans should be tailored to the particular circumstances of a country. In the more advanced of the developing countries, the main problem of domestic construction industries is the shortage of management skill; this is reflected by the internal problems of administration, low creditworthiness, and poor public representation of the industry. Managers usually are conversant with the technical aspects of construction and can adequately assess risk. The problem, however, is that organizations have grown beyond the capacity of their managers to manage single-handedly, without having developed the capacity and skills to delegate. The training of managers and entrepreneurs in peer groups, whenever possible using local business administration schools, is one solution to the problem. The shortage of skills, however, may be more generalized and include operators and tradesmen; in this case, a wider-reaching training program that makes use of or adapts existing facilities is recommended.

In the poorer countries, the type of problem and the approach to be taken is different in scope, but not in substance. In some of these countries, no domestic contractors are available, so help is needed to develop building contractors and small enterprises for quarrying and transport of materials. In other countries, there is a substantial demand for construction and maintenance of civil works and their construction industry is in an early stage of development. The problems in these cases are also largely human, and related to management, but need to be tackled through more intense efforts than those required for the more advanced construction industries.
In the poorer countries, a gradual coaching is required to enhance the capacity of construction entrepreneurs to accept increasingly higher levels of risk without compromising the quality of the finished product. In the initial stages, high levels of technical assistance, competent supervision, and conditions of contract whose terms and implications can be understood by the contractors can be effective in fostering the nascent industry. Technical assistance has to be concerned not only with the quality, cost, and timeliness of production, but also with guiding the contractor through the process of construction and helping him to acquire sound experience. The use of “procedures specifications” to supplement performance-only specifications has been shown to assist in this process. It is also necessary that the contracting authorities accept some of the risks and costs involved in the learning process. Some of the conditions in the contracts suitable for the formative period may include:

- Advance payments calculated to satisfy initial liquidity requirements.
- Prompt progress payments with a provision for accruing commercial interest for the period of delay.
- Modest retention out of progress payments instead of a performance surety.
- Frequent progress payments, particularly for labor-intensive construction.
- Partial payment for materials when they arrive on site.
- Renting of equipment by the owner to the contractor.
- Readiness to grant time extensions without penalty, if warranted by the learning process.

The first two are normal contract requirements; the combination of these conditions appropriate for each case will depend on the situation in the country and on the type of construction in hand.

Two critical issues that arise are what form of contract should be used and how the targeted contractors for this kind of approach should be selected. Generous cost-plus contracts with provisions for cost overruns are an example of one approach; it consists of providing such easy financial conditions to the contractor that he can learn from his mistakes without much risk. This approach obviously provides considerable scope for inefficiency and corruption; it would be best to avoid it. One alternative is to use unit price or lump sum contracts; these can be bid competitively within peer groups, subjecting prices to a close scrutiny, to identify and reject those which are impractically low and to limit the volume of work given to any one contractor to a level that is commensurate with his capacity.
One of the essential factors which assisted in the development of the Korean construction industry was the "stratification" of competitive bidding, through which the smaller companies were allowed to develop in a medium compatible with their own resources. Another way is to select participating contractors by prequalification alone (as was done in Ghana), by structuring the work in such a way that almost all eligible contractors will win a part of the work (Bihar, India, is an example), or by simply preselecting the group of contractors (for instance Kenya). Close, competent, and supportive supervision is always essential.

These approaches to fostering nascent contractors will often be more expensive initially than the use of seasoned foreign contractors to perform the same work. But the experiences in Ghana and Kenya have shown that, compared with force account, adoption of these approaches can result in immediate cost savings and improved overall performance, while expediting the development of a competitive domestic construction industry in the long run. Nevertheless, the protection given to the industry must be controlled in scale and limited to the period of infancy.

The expansion of force account operations should be discouraged where work can be done on the basis of competitive bidding. Where competitive bidding is not possible, suitable cost accounting systems and clear lines of accountability should be introduced, on the basis of which efficiency can be measured. Where competitive bidding is not possible because of a lack of domestic options, a policy and procedural environment should be fostered, to encourage the emergence of such options, either as private firms or autonomous parastatals which compete for contracts in normal commercial terms.

Some promising new approaches are now under consideration to introduce commercial management practice and accountability into force account units. The objective is to turn them into autonomous organizations that are capable of performing competitively. One feature of the approach can be to include technical assistance by experienced international contractors whose cost is included in the new organization's bid. To motivate the foreign firm to provide a high quality of technical assistance, incentive payments can be made to vary in accordance with the performance of the domestic enterprise. The performance can be judged against a target reference price (such as the bid value, for instance). This approach is being used in Ethiopia and a variation of the approach is being considered in Guinea. Another variation of this approach has been used successfully in the People's Democratic Republic of Yemen for the development of a state construction enterprise with the help of an external organization.

In light of the extensive experience available and the growing needs of
member countries for both more employment and more small works, increased emphasis should be placed on the use of appropriate construction technology and the various organizational forms—especially community and private or cooperative self-help arrangements—usually associated with it. At an early stage of considering construction or maintenance activities involving a substantial volume of small-scale, low-technology work (as in rural roads, irrigation works, schools, health centers, and so forth) attention must be paid to the prevailing market wage, particularly in areas suffering from unemployment or underemployment. The question must be asked whether the engineering will be reasonably consistent with the likely availability of labor at such wages and whether it will be cost-effective to use labor-intensive technology. If contractors in the area are confronted with much higher wages than those prevailing in other sectors, ways must be found to overcome the effects of this price distortion.

Attention also needs to be paid, particularly in building construction, to local practices and local materials, in the construction of simple houses, schools, and on-site sanitation works. Consideration should continue to be given to means to facilitate self-help construction; the means could include, for example, simplification of building codes, clarification of titles, and establishment of cooperatives for procurement of materials in bulk.

The success of the strategies in support of construction, outlined in this paper, will hinge on the commitment of the government. Given a country where there is a substantial gap between the services needed from the construction industry and their effective availability; and that this gap is likely to persist unless special measures are taken; and given the nature of the orchestrated actions, sustained over relatively long periods, which are required to develop the industry, success will largely depend on how interested and committed the authorities are to the development of an efficient, domestic capacity and how prepared they are to undertake difficult reforms of legislation and contracting procedures and make a concentrated and sustained effort to help overcome problems and constraints.
Figure. Annual Growth Rates for GDP, Manufacturing, and Construction in Selected Countries, 1970-79

Colombia

Brazil

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<th>Year</th>
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Figure (continued)

Ethiopia

Federal Republic of Germany

100
Figure (continued)
Figure (continued)

Peru

GDP
Construction
Manufacturing

Sweden

GDP
Construction
Manufacturing

Figure (continued)

Ghana

Italy

103
Figure (continued)

Sri Lanka

- GDP
- Construction
- Manufacturing

United Kingdom

- GDP
- Construction
- Manufacturing
Figure (continued)
Annex 1

Framework Terms of Reference for Studies of the Construction Industry in Developing Countries

This outline presents the main points which should normally be covered in a study of the construction industry in a developing country. It is presented in the manner of a checklist of subjects, which should be adjusted for each country, since many of the entries may be redundant in particular cases. Conversely, it may have omitted country-specific issues; careful analysis is, therefore, recommended in adapting this outline for use in particular countries.

1. Objectives

The objective of this study is to identify the main constraints and obstacles preventing the domestic construction industry of (Country) from assuming a more effective role in the country’s construction and maintenance programs, within the limits of an economically desirable scale of development of the industry; and to develop appropriate detailed plans of action to overcome those constraints.

While the following sections attempt to present a comprehensive list of the aspects that need to be considered, the work process should be to undertake a brief but balanced and careful overview, and then to focus, as soon as possible, on the main issues on which action is needed. Most of the effort of the study will, thus, be devoted to identifying and considering alternative, viable solutions to the problems and to working up action plans for their implementation.

To ensure full commitment of the government and of the industry to the execution of the strategy and action plans, they should be developed in close collaboration with the government office responsible for the construction industry or, in its absence, with the government office temporarily appointed to act as liaison agency for the study team, and with the construction industry’s representatives and professional associations.

2. Scope of the Study

The study of the construction industry of (Country) and its environment, and the formulation of a strategy and action plans will be based on a careful
consideration of the following subjects:

2.1 STRUCTURE OF THE INDUSTRY

(a) Historical development of the industry in (Country). Emergence of entrepreneurs and leaders and ownership characteristics of construction enterprises. Traditional construction technology.

(b) Participation of the industry in the economy of the country: contribution to GDP, contribution to employment, nominal productivity per capita, backward and forward linkages, particularly with the construction materials industry. Comparison with developed countries and with countries at a similar stage of development as (Country). Identification and analysis of anomalies.

(c) Participation of the main sectors of the industry. These include the informal sector, organized community construction, public sector agencies or enterprises, the private sector, and foreign contractors, in the satisfaction of the overall demand for construction and maintenance services; historical participation, and future trends.

(d) Experience with joint ventures and domestic subcontractors of foreign firms.

(e) General appreciation of the efficiency or otherwise of the above sectors and their ability to respond to the demand for building and civil construction and maintenance services.

2.2 DEMAND

(a) Overall demand: historical series, fluctuation of annual growth rates relative to the manufacturing industry and GDP, identification of trends.

(b) The specialization of construction demand (i) in respect of building and civil construction and (ii) arising from the private and public sectors. Historical series and future trends. Geographical distribution.

(c) Forecast future demand, identifying in particular:

(i) Recurring demand for construction and maintenance services which can potentially be supplied by the domestic private sector and/or by autonomous parastatal enterprises.
(ii) Recurring demand for construction and maintenance services which would preferably be catered for by force account operations (for example, excessively small scale, dispersed works, pilot projects, and training).

(iii) Demand for larger construction works which can be handled by domestic enterprises, either by slicing and packaging or by providing those enterprises with technical and financial assistance.

(iv) Demand for larger or highly specialized construction work, requiring expertise or capacity that is not available in the country.

(d) The process of generating demand. The influence of the government's planning and work execution programs in the generation of public and private demand for construction services. Policies (economic, financial, fiscal, and so forth) influencing demand and their effect on specific types of demand.

2.3 THE INFORMAL SECTOR AND ORGANIZED COMMUNITY CONSTRUCTION

(a) Components of overall demand which could potentially be satisfied by self-help construction.

(b) Needs of the informal sector and organized community construction, regarding technical assistance and direct support.

(c) Government and nongovernmental organizations concerned with supporting self-help construction efforts. Inter-organization coordination and collaboration.

2.4 PROCUREMENT AND CONTRACT ADMINISTRATION

(a) Procedures for procurement in the public and private sectors. Regulations for bidding or negotiating construction and maintenance work. Existence and adequacy of contractor's registry. Time consumed and difficulties encountered in the post-bid process, up to the start of work.

(b) Contract forms and contracting practice. Their suitability for an infant industry. Fairness of contract provisions, particularly in the apportionment of
risk between owner and contractor; compensation to the contractor for
default by the owner (for example interest payable for late progress
payments, or compensation for delays induced by the owner); adequacy of
provisions for price escalation and settlement of disputes. Existence of
indices or data sources for applying escalation provisions.

(c) Policy and legal framework for contracting with public sector con-
struction organizations.

(d) Adequacy of owner’s establishment to manage contracts and supervise
construction. Autonomy of government supervisors. Adequacy of delegation
to consultants employed for supervision; restrictions which may inhibit the
engagement of competent supervisors.

(e) Adequacy of the engineering process to the level of development of the
domestic construction industry (for example, is the contractor required to
tender on preliminary engineering and to finalize engineering as part of his
brief? Are method specifications used to supplement performance speci-
fications to assist an infant industry?).

(f) Procedures being used, or potentially applicable, to foster the infant
industry (or a sector). Special provisions which must be introduced for this
purpose.

(g) Anomalies and difficulties observed in the process of procurement,
management, and completion of construction contracts.

2.5 CHOICE OF TECHNOLOGY

(a) Potential for the employment of alternative technologies in construction.
Geographical identification of potential areas for labor-intensive con-
struction. Traditional construction methods and present-day attitudes toward
labor-intensive construction, and the use of locally available or traditional
construction materials.

(b) Financial cost-effectiveness of labor-intensive construction, vis-a-vis
equipment-intensive construction. Pricing distortions: prevalent and legal
wage levels, foreign exchange and tariff regimes which may favor
equipment-intensive construction. Different wages and social law regimes
for state and private sectors. Economic neutralization of distortions (for
instance, shadow pricing to remove biases). Intermediate mixes of labor and
equipment.
(c) Pricing distortions which may influence choice against locally available, traditional construction materials.

(d) Legal, administrative and employment conditions which may influence a choice against labor intensity or may hinder its applicability: permanence in employment; excessive social charges which do not benefit rural construction labor; and slow flow of payments to field labor.

(e) Availability of managers and technical personnel for labor-intensive work. Main restrictions affecting supply. Likely alternative sources of managers and technicians.

(f) Codes and standards. Their adequacy for country conditions and for the use of labor-intensive construction methods, locally available materials, and/or traditional technologies. Design bias against appropriate technology.

2.6 THE INDUSTRY

(a) Level of development of building and civil construction sectors, classified into nonexistent, infant, medium-range and advanced categories, according to specified indicators of complexity and volume of the operations the domestic enterprises can handle.

(b) Ownership and organization of construction enterprises: state and private. State: force account and parastatal enterprises. Private: individual, family, or corporate. Problems and constraints of each; in particular, efficiency of each type of organization.

(c) Entrepreneurs and managers. Their status in society. Potential supply of entrepreneurs and managers. Traditional attitudes. Willingness of leaders to learn modern management techniques. Facilities available for coaching entrepreneurs and managers. Salary levels.

(d) Supply of engineers, architects, estimators, surveyors, accountants, senior clerks, foremen, and other middle-level managers. Traditional sources, adequacy of supply, and training facilities available. Salary levels.

(e) Supply of building and building services tradesmen, equipment operators, and mechanics. Adequacy of supply and training facilities available. Proficiency levels relative to the quality of finished work. Wage levels.

(f) Supply of unskilled labor. Migratory, agricultural demand and other
long-term or seasonal problems affecting the availability of labor and of any other construction employees. Wage levels.

(g) Adequacy of salary and wage regimes for state and private construction enterprises. Problems arising from these regimes.

(h) Labor productivity. Feasible incentives.

(i) Welfare and safety of personnel.

(j) Equipment resources. Restrictions for the importation and ownership of construction equipment. Standardization. Availability of spare parts and servicing facilities. Restrictions on the importation of spare parts. Availability of equipment leasing or hiring facilities. Availability of excess equipment in government fleets which could be sold or hired out to contracting enterprises. Prices of consumables.


(l) Technology gaps: in estimating, planning, organizing and managing construction work, cost control, and construction technology. Quality of finished work.

(m) Research and development (R & D) facilities available for the industry; identification of needs. What R & D work has been carried out in the past? Are its results being used?

2.7 FINANCING

(a) Financing, bonding, guarantee and insurance requirements of builders and civil contractors.

(b) Perception of the industry by domestic financiers, bondsmen, and insurers. Financial indicators which confirm or do not confirm this perception.

(c) Particular characteristics of construction risk in (Country).

(d) Availability of credit for the industry: from commercial banks, DFCs, nonbanking sources, suppliers’ credit. Terms and conditions on which credit,
bonds, and guarantees are advanced to the industry. Capability of the industry to meet those terms and conditions.

(c) Availability of suitable insurance facilities: CAR and other forms of insurance required in contracting.

(f) Suitability of contractual arrangements (advances or progress payments) in the context of the financial resources available to the industry. Acceptance by financers of government progress certificates and other contractual documents for discounting. Terms of such discounting.

2.8 LEGAL

(a) Taxation regime applicable to the construction industry. Tax exemptions and concessions (particularly, incentives for reinvestment), depreciation allowances, infant industry concessions. Protection of industry against foreign competition. Freedom of action for private enterprise; protection of state enterprises against private competition. Pricing and profit controls.

(b) Employment regime. Permanence of labor in construction industry employment. Wage-fixing procedures, free bargaining. Social laws (health, insurance, pension, and so forth) applicable to construction, services offered in return. Methods available for settlement of disputes. History or periodicity of disputes.

(c) Importation regime. Duties levied on equipment, spare parts, and materials. Treatment of domestic and foreign companies. Restriction in the availability of foreign currency.

(d) Company and ownership laws applicable to the industry.

(e) Codes and regulations affecting the industry (for instance, licensing of builders and contractors, determination and limitations of responsibility, building codes, safety and fire regulations).

2.9 INSTITUTIONAL

(a) Existence of a government office responsible for development of the industry and for liaising with industry institutions.

(b) Existence of an institution representative of the industry, capable of presenting its views to the government in matters affecting construction, and
providing, management information and training services to construction enterprises.

(c) Existence of professional associations related to the construction activity (for engineers and architects, for example).

3. Strategy and Action Plans

A comprehensive strategy for development of the industry will be prepared, to enhance the level of development of the industry. The strategy will propose short-, medium-, and long-term objectives. These shall take into account the state of development of the country’s economy and its likely evolution when proposing a time frame.

A small number of action plans, aimed at resolving key problems and constraints identified in the strategy as having a high priority will be prepared. The plans will contain schedules and programs for their various steps, the persons or institutions responsible, the estimated costs and likely sources of funding, and the standards by which to appraise the results of their implementation.

4. Study Team, Program

The study team, and the program for the study will depend on the particular circumstances of the country; the state of the economy and the industry; the availability of local assistance and good sources of information; the extent of travel, and so on. In general terms, a small country with an incipient industry and fairly well defined constraints may demand a few weeks’ study by one or two professionals; the problems of a more sophisticated industry may demand contributions from experts from a wide range of disciplines and demand several months.
Annex 2

Some Relevant Documents and Publications


This list (which is not exhaustive) refers only to publications which have bearing on general development aspects of the construction industry. Many other publications exist, particularly in specialized fields such as construction technology, estimation, construction management, cost accounting, contracts, and contract law. The library of the Construction Industry Unit of the World Bank holds a wide variety of publications on general and specialized aspects of construction, as well as country-specific reports for many member countries. These are available for consultation at the Unit's library.
The construction industry is an important contributor to the process of development. Construction work represents about one-half of the gross capital formation and 3 to 8 percent of the gross domestic product in developing countries. Fostering a domestic capability in construction is becoming an essential part of the overall development process in these countries.

*The Construction Industry: Issues and Strategies in Developing Countries* presents a profile of the construction industry; it discusses its problems and constraints and formulates strategies for future actions to foster its improvement and growth. The book draws heavily from the experience accumulated in The World Bank in supporting domestic construction industries over the past ten years; this gives it a special experiential quality.