



TOGETHER
for a sustainable future

OCCASION

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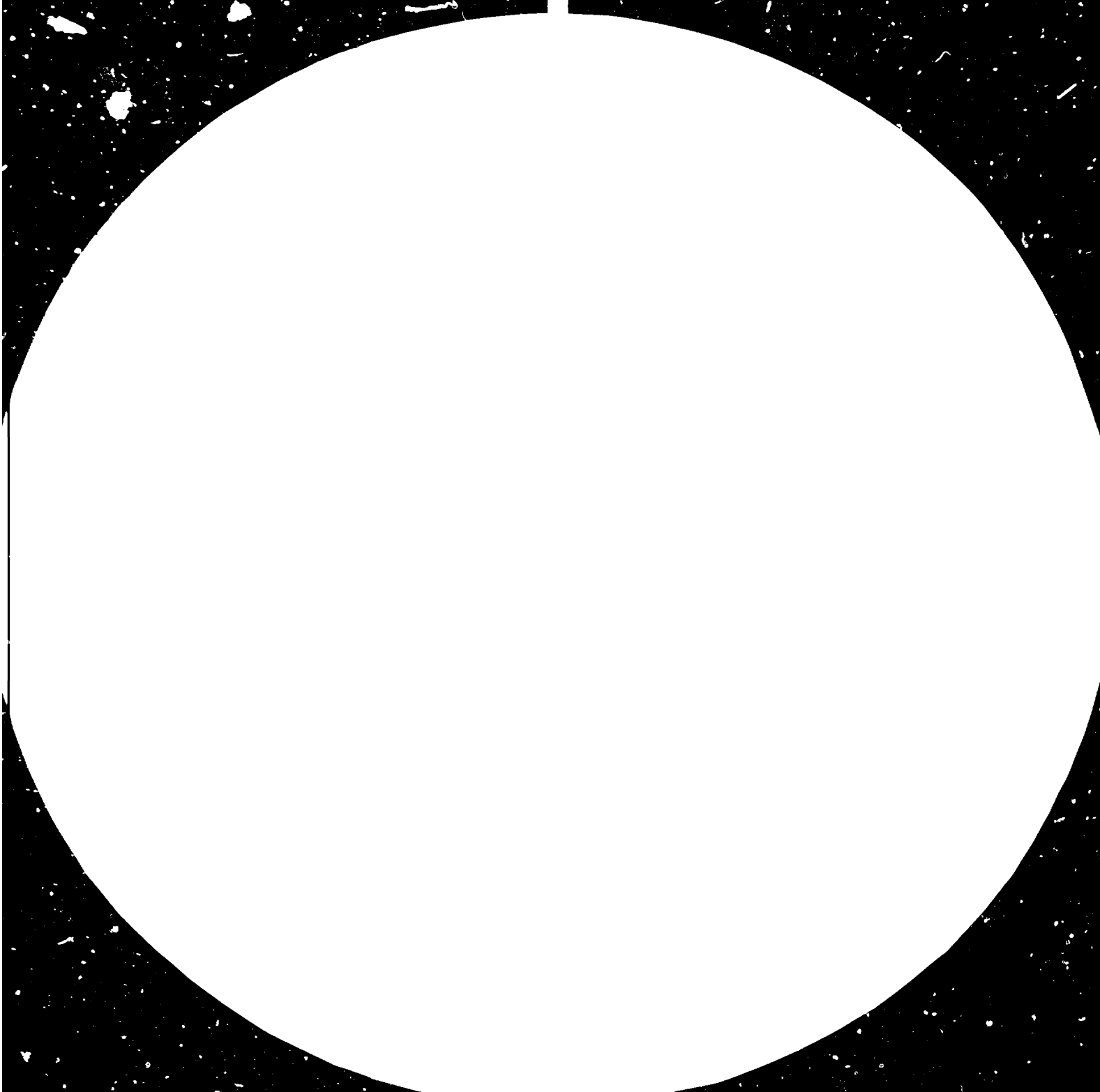
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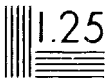
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Preface

Since 1967, the United Nations Industrial Development Organization (UNIDO) has adhered to its mandate "to promote and accelerate the industrialization of the developing countries" by responding to requests for technical co-operation in all aspects of industry from the Governments of those countries.

This commitment to industrialization as a means of improving the living standards of nearly three quarters of the world's population, which was first outlined in November 1966 by the United Nations General Assembly in its resolution 2152 (XXI), has since been intensified. The Lima Declaration and Plan of Action on Industrial Development and Co-operation, which was adopted by the Second General Conference of UNIDO in 1975, called for an international effort to increase the developing countries' share of world industrial production to 25 per cent by the year 2000. This goal was further emphasized at the Third General Conference of UNIDO, held at New Delhi, India, in early 1980, with the adoption of the New Delhi Declaration and Plan of Action on Industrialization of Developing Countries and International Co-operation for their Industrial Development.

In the series of booklets *UNIDO for Industrialization*, of which this is one, an attempt is made to describe briefly the contribution of UNIDO, through its Division of Industrial Operations, to the industrialization of the developing world and to give examples of what has been done and will continue to be done to accelerate the process.

FINANCING UNIDO ACTIVITIES

The bulk of the costs of UNIDO administration and research, now approaching \$US 48 million annually, is met from the regular budget of the United Nations, as are some lesser expenditures reserved for certain advisory and training activities. Once UNIDO achieves the status of a specialized agency within the United Nations family, it will cease to be funded from central sources of the United Nations and will rely on its own budget based upon contributions from its member States.

Technical assistance programmes for projects in developing countries, however, are funded from varied sources, the most important of which are summarized below.

By far the largest share of the field activities of UNIDO, some 70 per cent of the total, is funded from the **United Nations Development Programme (UNDP)**. Thus, a high proportion of UNIDO field projects are subject to UNDP approval before implementation. Since the ultimate source of this money is the contributions of the member States themselves, both developed and developing, it can truly be said that UNIDO field activities are self-help programmes, initiated only at the request of Governments of developing countries and using funds to which many developing countries themselves contribute. These funds are allocated to particular countries from UNDP sources up to a predetermined amount known as the indicative planning figure (IPF). They cover the whole spectrum of United Nations assistance to those countries, industrialization being only one of many programmes needing financial support.

Country programmes normally have a five-year span; and the available funds, which vary from country to country and are weighted in favour of least developed countries, must be allocated to specific projects within a country during the five-year period.

Special Industrial Services (SIS) funds are confined to a narrow range of expert services provided for unexpected high-priority projects that are called for from time to time. The programme is restricted to short-term projects of limited cost, and during recent years \$US 3.5 million has been set aside annually to support it.

The **United Nations Industrial Development Fund (UNIDF)** was created to finance innovative projects, preferably projects having a multiplier effect. The Fund consists of contributions pledged by individual Governments, and in some cases the purpose of the contribution is specified. Pledges are made in convertible and non-convertible currencies.

Trust funds are provided by participating Governments for specific projects to be executed by UNIDO in accordance with agreements reached with the contributing countries. They are used, typically, for technical assistance, expert services and specialist training.

The small **regular programme of technical assistance** provides funds for types of technical assistance that either complement other programmes or do not lend themselves conveniently to alternative means of financing. In particular, this type of funding permits a certain degree of flexibility in spending, since the allocation of the funds available is entirely under the control of the principal policy-making organ of UNIDO, the Industrial Development Board. Programmes are designed to reflect the emphasis on special measures for the least developed countries, on technical co-operation among developing countries and on establishing and strengthening industrial training facilities in developing countries.

Building materials and construction industries

While the building materials and construction industries are important sectors of the economy in all countries, in the developing countries, where the need for adequate housing and adequate social and cultural facilities is overwhelming, their importance is enhanced. Indeed, without these sectors significant industrial expansion would scarcely be possible. Apart from their economic contribution as major employers of labour and potential users of local raw materials on a very large scale, and consequently a source of national wealth, the influence of the building materials and construction industries extends into the areas of education, health, community life and administration.

In most developing countries, significant amounts of foreign exchange are spent on importing building materials, components and equipment, representing a considerable financial strain. Thus, great benefit is to be gained from the development of local building materials industries, particularly when it is integrated into the national plans covering other economic sectors.

Ideally, the building materials and construction sectors should constitute an economic pacemaker, particularly in the early stages of development. The technologies in both are highly labour intensive, offering opportunities for skilled and unskilled workers alike; both offer unrivalled opportunities for on-site training of the industrial work-force; and both provide a basis for greatly improved social conditions.

In this sector, UNIDO is mainly concerned with:

(a) The production of building materials and the introduction of methods of construction that will enable adequate housing to be provided to as many families as possible;

(b) The widespread construction of schools, hospitals, public buildings and industrial premises;

(c) Expanding employment.

In its policy, UNIDO emphasizes:

Securing of sufficient supplies of a full range of building materials from local resources

Decentralization of the building materials and construction industries whenever justified

Full utilization of local resources, including wastes

Maximum use of local labour

Use of low-energy-consuming technologies

Maximum exploitation of low-cost and renewable fuels

Introduction of technologies in keeping with local building traditions and suitable for the prevailing climate

The goal of UNIDO is to foster an indigenous, self-sustained growth that will lead to self-sufficiency in the sector by the year 2000.

THE BUILDING MATERIALS INDUSTRY

Heavy clay products: brickmaking

Burned bricks have been traditionally produced in many developing countries by simple cottage-industry operations designed to meet purely local demands. These small brickyards, often producing bricks of low quality, are typically to be found in urban sites quite unsuited to large-scale, modern production of bricks of an acceptable quality.

Today, however, building materials of a higher standard are needed, and the construction of mechanized brick plants has started in most countries – typically with one brick plant located in or near the capital.

UNIDO has assisted in establishing small-to-medium-sized brick and tile plants, endeavouring to preserve a balance between mechanization and labour intensiveness in many less developed countries; in others, UNIDO has assisted in the modernization of existing plants, ensuring increased production and good building quality.



A demonstration brick kiln built in Blantyre, Malawi

In many areas more people will benefit if small production units are scattered throughout the country rather than being concentrated in a few industrial centres. Therefore UNIDO has focused its attention on very small enterprises that produce for their immediate locality, assisting them to improve moulding and firing techniques that will make the use of renewable fuels economic.

In promoting the transfer of technology, UNIDO encourages developing countries in a particular area to co-operate in establishing common training and research facilities. With UNIDO assistance, several African countries are co-operating in planning a clay products development centre in Lusaka, Zambia. The centre will be concerned with the introduction of suitable technologies in the countries co-operating and will carry out training programmes, investigation of raw materials and other laboratory and pilot-plant activities.

Natural building stone

In many developing countries natural stone – marble, granite, basalt, sandstone, slate etc. – has been largely ignored in favour of other building materials that offer fewer advantages and are frequently more difficult to obtain.

No other mineral-based non-metallic building material can be produced more simply. Production of stone blocks demands less energy than other materials. Building stone is a low-cost resource; it requires no firing, kilning or hardening; it can be produced and prepared by very small working units; it is labour intensive; and only a moderate investment is required. It is a tough and durable material, readily shaped and finished; wastage is low, and surplus and damaged materials are adaptable to other uses. In addition, as monumental buildings illustrate, stone is aesthetically pleasing.

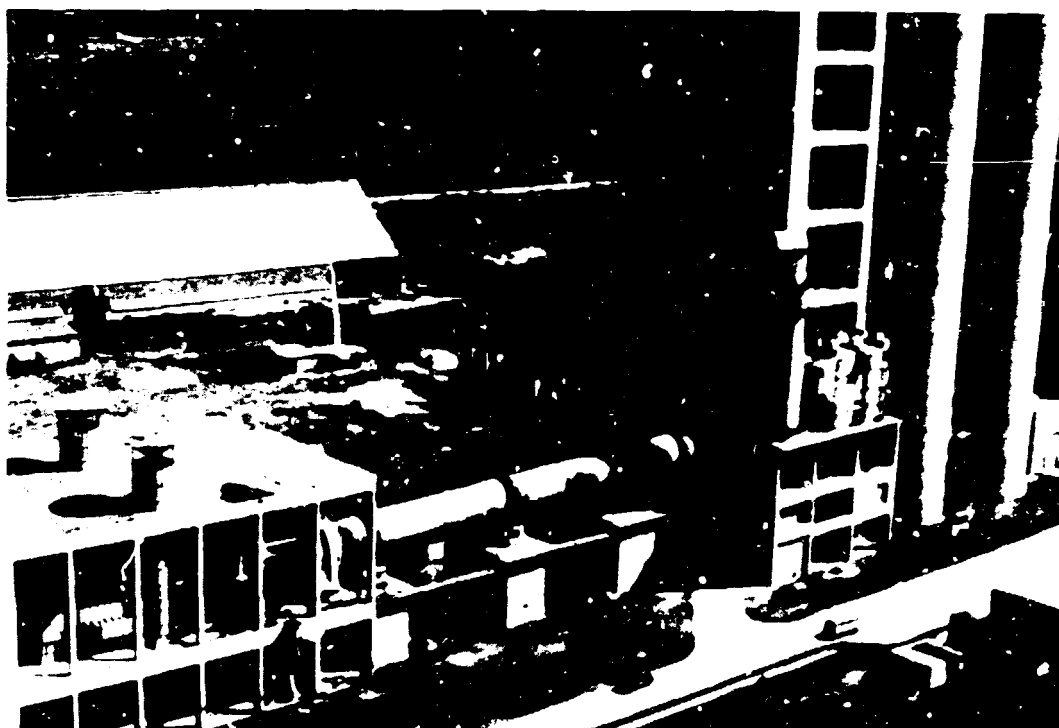
In early stages of industrialization the production of natural stone building materials offers a possibility for on-site training of workers, which can form a basis for later training schemes over the whole construction industry. Building-stone technology is fairly uncomplicated, requiring only a limited range of hand and machine tools, yet to produce a specialized product such as a rounded kerbstone calls for a high degree of craftsmanship and accuracy.

When a building-stone industry is introduced into a country, its development should be integrated with that of complementary building materials, to achieve a sound construction sector as a whole.

An interesting example of UNIDO co-operation in expanding the building-stone industry of a developing country is to be found in Haiti. Here UNIDO is assisting in carrying out an inventory of local stone resources that is revealing astonishingly rich deposits of basalt, limestone, granite and marble in a variety of colours – rose, white, black and grey. A training and demonstration centre is helping the local industry to grow and is making its facilities available to other countries in the Caribbean.

Cement

Cement and allied materials are now so familiar in their applications and so basic to a great range of buildings, public works, roads, railways and water engineering projects the world over that some developing countries may fail to explore the possibility of developing other technologies based on maximum utilization of local resources and the conservation of energy.



Profits made by keeping this factory in the Libyan Arab Jamahiriya at full production enable financial commitments to be met

Through modernization and adaptation of existing cement-making plants, better quality, higher output and considerable savings in energy can be achieved. UNIDO can offer its technical services to Governments and advise on all aspects of the industry.

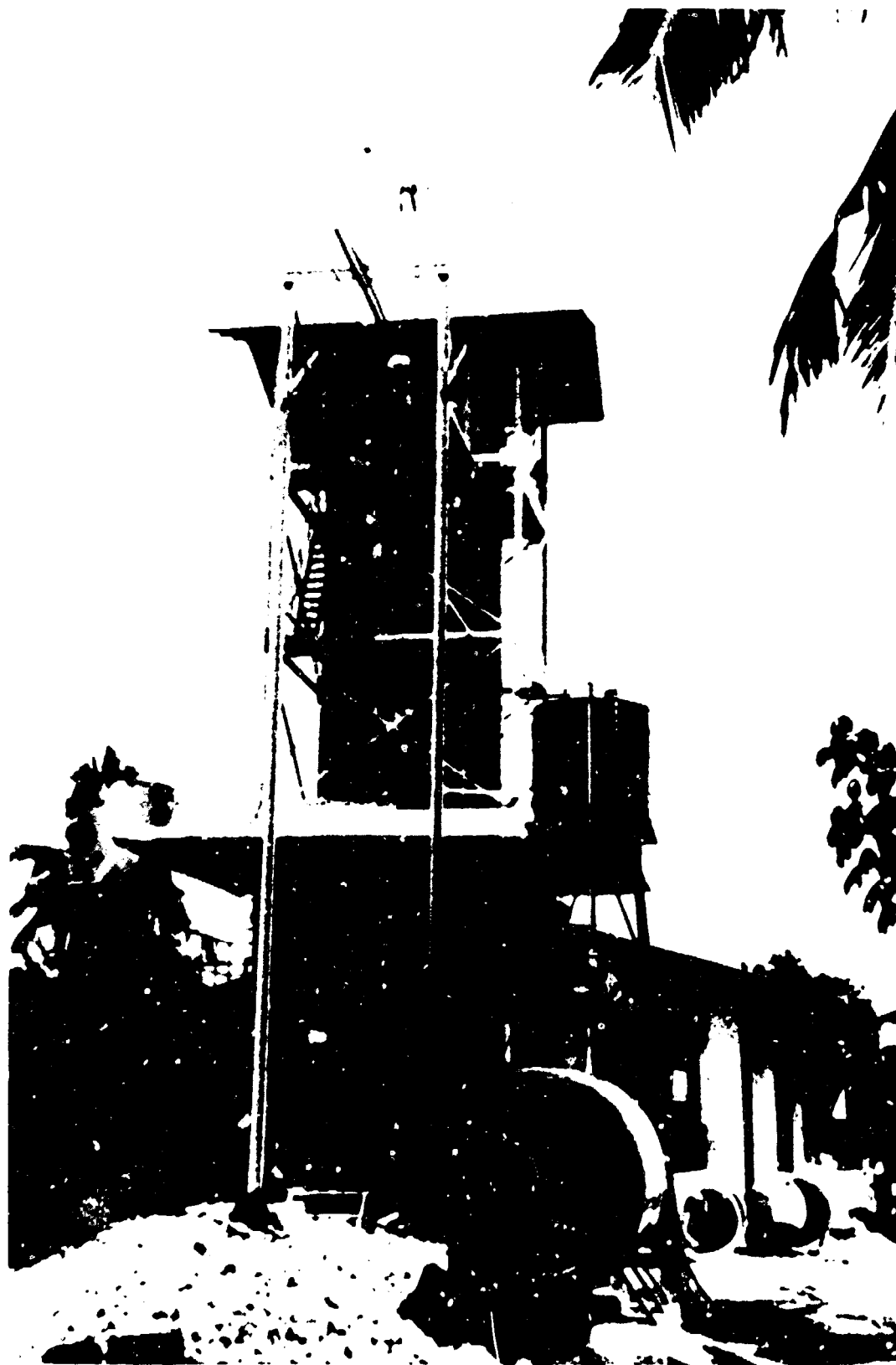
UNIDO has been involved in the rehabilitation of cement factories in Ethiopia and Niger, so that the plant will be fully utilized, while in Benin and Honduras, help has been given in establishing new factories to meet local needs. In the Libyan Arab Jamahiriya UNIDO has been assisting newly established factories to attain maximum production as early as possible.

In Turkey, UNIDO played a major role in establishing a national research and development centre for the Turkish Cement Manufacturers' Association.

Lime

Building lime still has a part to play in the construction industry of many countries, and it can often replace cement with a considerable saving

in costs. Lime, unlike cement, needs no large-scale industrial plant, since it can be produced in small units from uncomplicated installations; little skill is called for in its manufacture and thus work is provided to local labour.



A small industrial lime-kiln installed in Indonesia

A small industrial lime-burning kiln was installed by the Indonesian authorities working in co-operation with UNIDO experts. The first lime-kiln in Mali was established with the help of UNIDO, which is also assisting in introducing similar facilities in other countries.

Fine ceramics

As living standards rise throughout the developing world the demand for ceramic building components such as floor and wall tiles, vitrified sewer pipes and sanitary ware will also rise until inevitably local manufacture will become necessary.

UNIDO has had long experience in this field, and, at the request of Governments, stands ready to assist developing countries with the production of ceramics. In Benin, for example, UNIDO assisted in the construction and start-up of a tile plant, while in Bangladesh, where several ceramics plants are already in operation, UNIDO is co-operating with the national Ceramics and Glass Institute to help the ceramics industry to improve the quality and volume of production and to broaden the range of products manufactured.

An important feature of the work of UNIDO is the UNIDO-Czechoslovakia Joint Programme for assistance to the ceramics and related industries. Through this programme UNIDO helps to make Czechoslovakia's extensive knowledge and experience available to the developing countries and fosters joint research on their behalf. For example, a mobile diagnostic unit travels from kiln to kiln collecting data on firing conditions and advising on how to reduce consumption of energy.

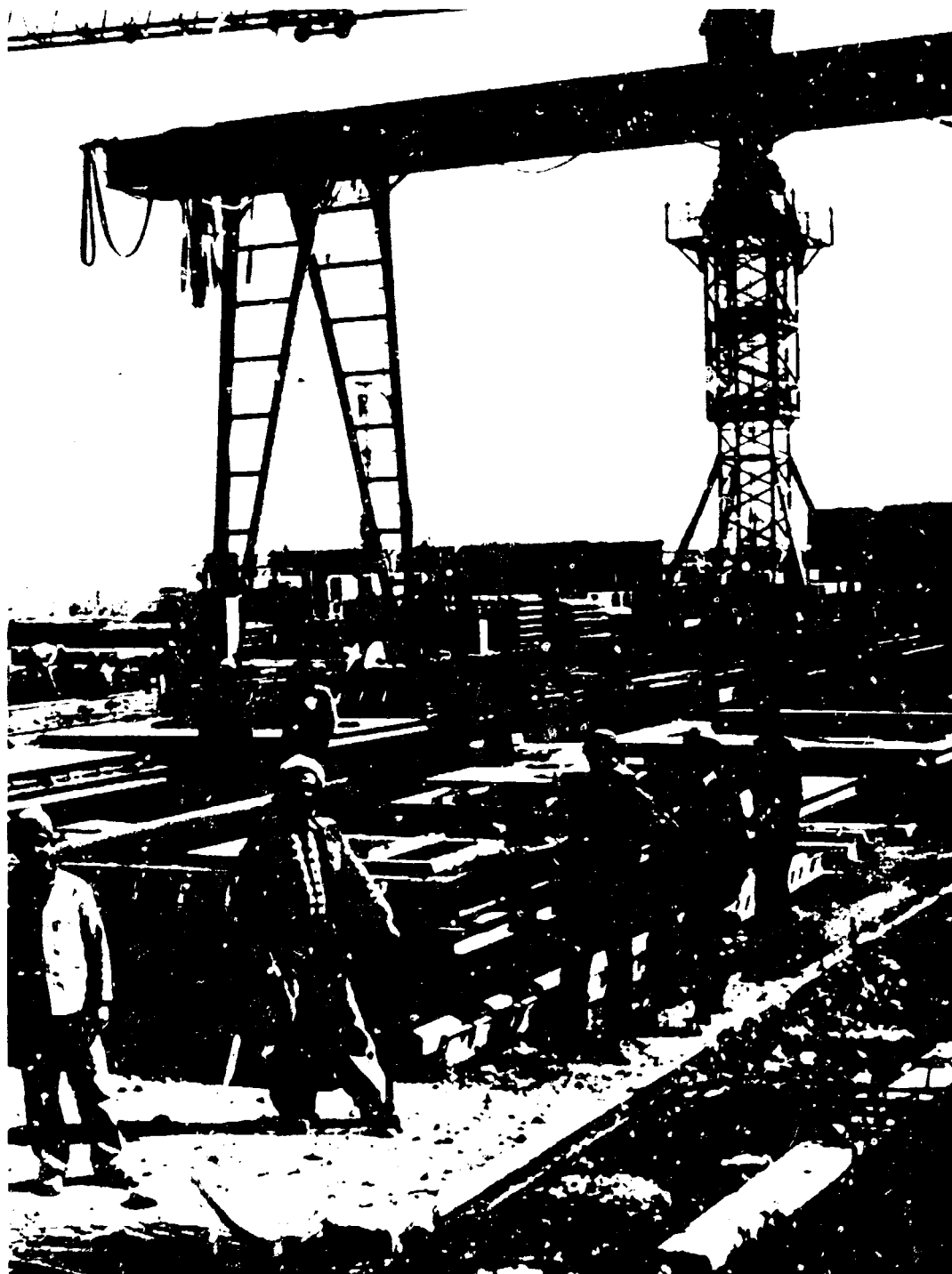
Sheet glass

With the increasing industrialization of the developing world, the demand for sheet glass of all types continues to grow. At present, world demand is met predominantly by the major manufacturers of float glass in the highly industrialized countries; and as demand grows both in terms of quantity and sophistication, so does the developing world's reliance on traditional import sources.

The clear need is for the introduction of the glassmaking industry into many developing areas, where sheet glass can be manufactured using the Fourcault process in small or medium-sized plants in sufficient volume to satisfy local or regional needs. Production of glass requires large quantities of easily accessible raw materials from local sources, and local labour can be used. Transfer of glassmaking technology can thus reduce the need for imports. UNIDO is able to assist in promoting local sheet-glass industries.

In recent years the world market for window glass has become increasingly dominated by the exports of float glass produced in large-scale plants located almost exclusively in the industrialized countries. At the same time the growing markets in the developing countries have favoured the promotion of local sheet glass manufacture on a quite different scale,

based on Fourcault technology. In Africa, south of the Sahara, where this industry is still in its infancy, UNIDO has been helping to run the first and only factory in operation, a plant with a capacity of 7,000 tons per year in Bendel State, Nigeria. In the United Republic of Tanzania, the Government has, with the technical support of UNIDO, concluded a contract for the establishment of a Fourcault plant with a capacity of 15,000 tons per year.



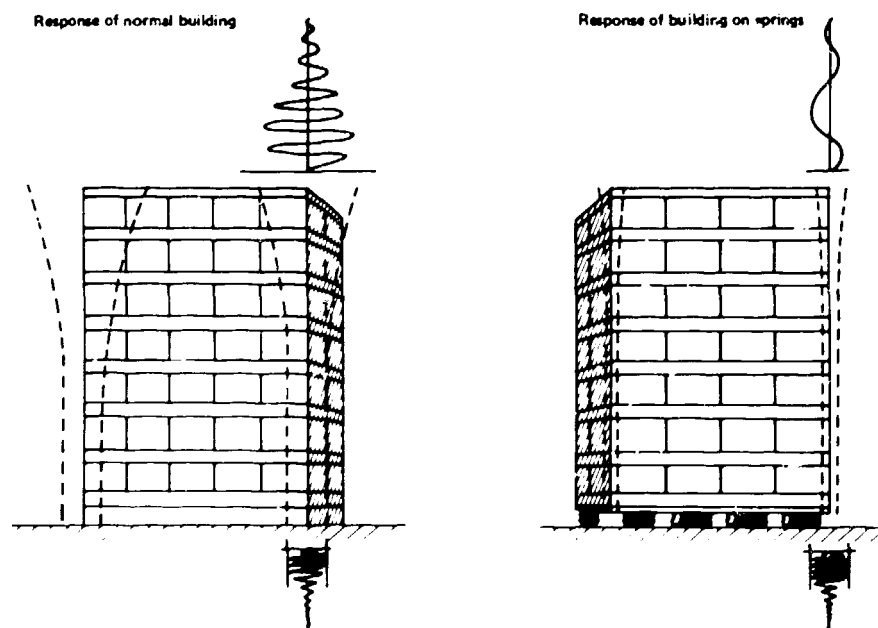
Making prefabricated housing units in Algeria

THE CONSTRUCTION INDUSTRY

The construction industry embraces every aspect of building, from planning and design to the completion of dwellings, hotels, industrial infrastructure, manufacturing complexes, recreational facilities, harbours, transport terminals etc. The industry is to be found in some form wherever organized society exists; and if the developing countries are to achieve their industrial goals, they will need assistance to enable the industry to progress from one using rudimentary building techniques to a sophisticated industry using complex technology. At each point along the way UNIDO is ready to respond to requests from Governments by offering its services, and, when indicated, its co-operation in major projects, including the establishment of research and development centres, training schemes and the introduction of the latest technology. Some examples of UNIDO assistance are given below.

In Indonesia, UNIDO helped to initiate a major low-cost housing programme; while in Algeria a UNIDO study of construction methods for pre-fabricated housing has led to greater productivity, improved quality of buildings, savings in energy and a reduced and more economic use of materials.

Following the destructive earthquake of 1979 in Yugoslavia and its many predecessors, UNIDO, in co-operation with the United Nations Centre for Human Settlements (UNCHS) and the Governments of Bulgaria, Greece, Hungary, Romania, Turkey and Yugoslavia, has helped to establish a network of existing research institutes to further research, development and training in building materials and building technologies suitable in seismic conditions. The project will facilitate co-operation among institutes in the participating countries, initiate co-operative research, act as a clearing-house for exchanging information, and provide training in the construction of earthquake-resistant buildings.



Protection of building against earthquakes through use of rubber springs

*For further information on UNIDO activities in the building materials
and construction industries, contact:*

Chemical Industries Branch
Division of Industrial Operations
UNIDO
Vienna International Centre
P.O. Box 300
A-1400 Vienna, Austria

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