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INTERNATIONAL ASSISTANCE
TO THE CONSTRUCTION SECTOR ^{1/}

by

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CONTENTS :

	Page
1. CONSTRUCTION SECTOR AND HIS IMPORTANCE	1
2. INTERNATIONAL ASSISTANCE	4
3. INTERNATIONAL ASSISTANCE BY UNIDO	29
4. PERSPECTIVE ORIENTATION OF THE INTERNATIONAL TECHNICAL ASSISTANCE	34
5. INTERNATIONAL COOPERATION IN THE FRAME OF INTER-STATE AGENCIES	40
6. RESOURCES AND POSSIBILITIES OF CSSR IN THE INTERNATIONAL TECHNICAL ASSISTANCE	48

1. CONSTRUCTION SECTOR AND ITS IMPORTANCE

The construction sector and the construction industry is an important branch of national economy and one of the decisive links in the realization of the investment. Thus it has a great importance for the industrialization of the economy of every country and for the economic progress in developing countries.

Consequently, every country pays special attention to the development of the construction sector and of the construction industry; construction sector is also in many countries subject of extensive concern of contractors because in relation to the investment activity it has a long-term perspective.

The specifics of the construction sector consist in comparison with the industrial activity especially in the fact that the production processes are mobile whilst the final product is as a rule untransferable. On the other hand, the production of construction materials, e. g. cement, bricks, ceramics etc. has at present a clean-cut industrial character and it is even possible to speak about a well-developed industrial production based on continuous technology, mechanization of the production process and on industrial organization of labour and production.

The construction sector itself runs through the process of industrialization and as a consequence of production of highly finished and completed parts and systems gets more and more a character of the industrial production.

The construction sector - due to the volume of processed materials and the difficulty of their transportation - is usually based in all countries on the local raw-materials basis and on the use and processing of acceptable raw-materials.

All indicated factors show the importance of international cooperation and technical assistance in the construction sector and in the construction industry and connected activities. Important is the geological exploration, search for suitable raw-materials and their testing, further developing of production of building materials and of new technologies in these productions, formation of technical personnel, elaboration of studies and projects for the utilization of local raw-material basis and of launching production in the construction industry, industrialization of the construction sector connected with the prefabrication of components etc.

Also important for the technical assistance is the information system on the achieved progress, on technical solutions and economic results of the construction sector and

of the production of building materials and the promotion of successful solutions and experience and know-how of developed and developing countries.

At the same time, also important is the assistance to the development of national scientific and technical potential and to the formation of qualified experts for the production and research.

Technical assistance to developing countries in the field of construction industry enables them to develop these production areas and in this way to create conditions for a more extensive investment (in the production area as well as housing and infrastructure) and its competent and quick implementation. Thus this technical assistance takes an immediate part in the formation of preconditions for industrialization in developing countries, for the raise of the living standard of the population, for the increase of employment opportunities in these countries, for the increase of qualification of people etc. It means that it contributes to the total economic and cultural growth in developing countries.

For this reason, United Nations and its agencies pay for a long time great attention to questions of international technical assistance in the construction sector and construction industry.

2. INTERNATIONAL ASSISTANCE

United Nations have been concerned in questions of housing, building and physical planning from the very beginning of their activity, especially in relation to developing countries. As early as in the first Plenary Session of the General Assembly the priority of solution of problems of housing in the world was stressed and the Economic and Social Council was charged to work out a programme of activity in this field to effectively and quickly help in improving the housing situation and in this way to contribute to increasing the living standard of the population. The Economic and Social Council itself has been engaged in the solution of these questions. Problems in the sphere of housing, building and planning, however, have been increasing all the time quantitatively as well as qualitatively. Still more urgently the necessity has been felt to deal with these problems in a systematic way and on a high professional level and above all the necessity of direct help to developing countries.

In 1962 the Plenary Session of the Economic and Social Council established the Committee for Housing, Building and Planning as one of its special agencies with the intention to concentrate its activity at developing countries.

Immediately after the constitution of the Committee it became evident that its activity must be secured in a more effective way. For this reason, in 1963, in the frame of the UN Secretariat the Centre for Housing, Building and Planning was established which ensures the fulfilment of decisions of the Committee and of accepted programmes of its activity. The Centre is, therefore, a real executive secretariat of the Committee. The Centre pays in its work a great attention to questions of international technical assistance to developing countries.

Together with it, many other UN agencies are concerned in international technical assistance, e.g. UNIDO, UNDP, UNESCO etc. and Regional Economic Commissions, viz ECE, ECAFE, ECA, ECLA and further UNESOB.

At present, the activity of all these agencies is concentrated on problems of housing building, on the development of the construction sector and building materials industry, on physical planning and on a series of questions connected with these problems.

This activity has a great economic importance. It was stated many times e.g. that in the countries of Asia and Far East nearly one-half to two-thirds of the investment in developing countries went into buildings and construction works and about 60 to 70 per cent of this investment was

accounted for by building materials and components. This depending on the stage of development, about 4 to 12 per cent of the gross national product was devoted to the production of building materials and components which indicated the crucial role of building materials in the growth process.

For this reason, these problems are subject to systematic attention. In the next part of this paper some results of the activity of the Committee's agencies are described.

The activity of UNCHBP can be divided into four extensive groups, viz:

- a) rendering service to individual UN agencies in relation to the work in the field of housing, building and planning;
- b) technical cooperation with developing countries in the solution of problems in the field of housing, building and planning, first of all providing extensive technical assistance to these countries;
- c) inciting development of research and studies of high-priority themes in the field of housing, building and planning, study of world problems and trends in this sector;
- d) organizing seminars, processing of reports and dissemination of know-how and experience gained in this sector in the course of technical cooperation or in research.

Generally, it can be said that the target of all activities is the coordination of efforts of individual countries - including efforts in the international field - aiming to better conditions in housing, building and planning and thus to a higher living standard of population and to the improvement of the environment. Special attention is paid in this direction to developing countries.

Very extensive is the activity in the field of technical assistance to developing countries. The Committee and above all the Centre investigates and evaluates requirements of technical assistance submitted by individual governments, helps at the selection of experts and carries out the technical supervision of their work in developing countries. Thus, e.g. in 1968 technical assistance was provided to 62 countries (mostly to developing countries) through 181 experts, in 1969 to 50 countries through 150 experts, in 1970 to 54 countries through 167 experts, in 1971 to 80 countries through 150 experts.

The character of technical assistance is various. In some countries it only provides services of individual experts for special problems, e.g. for investigation and implementation of different kinds of financing the housing building, for the delimitation of methods of estimation of present lack of flats and of future needs of flats, for the formation of filing and statistics in the sphere

of housing and housing building etc. In many cases, it is, however, the fulfilment of tasks for which it is necessary to provide teams of experts of different professions. It is e.g. for the formation of the governmental policy in the sphere of housing, building and physical planning, for the elaboration of development plans of housing building, of the construction sector and of physical planning, for the formation of research organizations and governmental and local agencies for the direction and implementation of the governmental policy in the sector, for the formation and education of employees, young workers etc. Last but not least, teams of experts are sent to developing countries for the organization and implementation of building houses or of whole districts as a model pattern or as a help in case of natural disasters or catastrophes. Experience of experts from the work "in the field" are later evaluated and utilized when providing technical assistance in other cases.

From many cases of technical assistance some are shown as an illustration: In 1963 e.g., technical assistance of UN was provided to Yugoslavia for the elaboration of the Master Plan of Skoplje destroyed by earthquake. In two years the experts sent by the Centre together with Yugoslav experts succeeded in the elaboration of a Master Plan for the city including detailed projects. On this basis the construction of a new modern city immediately began.

Experience from this work was used when planning a new town of CHIMBOTA in Peru which was in 1970 also destroyed by earthquake.

Recently, technical assistance of the Centre through international teams of experts has been provided to the elaboration of Master Plans of cities and regions of such an importance like Singapore and Karachi.

In Afganistan, with the aid of the Centre the Central Administration for Housing and Development of Towns was established and in 1971 a team of UN experts worked there as a consultative body for the elaboration of a programme of rehabilitation and development of afflicted territory.

In 1972 experts were sent to Somalia, Sudan, Algeria, Senegal, Yemen and to other countries to assist in the formation of the housing policy and in the elaboration of programmes of housing building.

In the sphere of development of building materials and technology in the construction sector UN experts worked e.g. in Somalia and Guinea.

The Centre - under the guidance of the Committee - organizes in cooperation with other UN agencies special seminars, symposia, conferences and other working meetings for experts from developing countries. These actions deal with a narrower circle of problems in the field of housing, building and physical planning. They are organized mostly

in some industrially developed country so that the participants may have the opportunity to get acquainted with the practice of the host country. Seminars are organized mostly regionally, e.g. for countries of Latin America, Africa etc. Seminars deal e.g. with planning of housing building, with the development of production of building materials including the utilization of local resources, with the organization of construction industry and its development, with the prefabrication in the construction sector, with the planning of metropolitan areas and of new towns, with the slum clearance, with physical planning and development of towns, with the financing of the housing and facilities building etc.

UNCHBP in conformity with its approved working programme for the period 1970 - 1975 tries first of all to link the solution of important problems of the housing policy with the solution of problems of urban and physical planning. It attempts the improvement of the situation in the housing construction, the improvement of level of social and collective facilities and the better utilization of building and construction materials. It carries out various investigations, organizes meetings, elaborates studies and formulates recommendations in the field of housing, building and planning. The Committee (or the Centre) further collects, evaluates and publishes statistics and

other information on economic, social, technical and administrative aspects of the housing building and physical planning. In the frame of the activity of the Committee the exchange of ideas, information and experience is being performed in all problems which arise during the investigation and collection of information. All these activities are performed with special attention to urgent needs of developing countries.

An important role in the process of international technical assistance to developing countries in the field of construction sector and construction industry is played by UNIDO.

In the system of agencies engaged in this activity, UNIDO takes an important place resulting from its function as a coordination agency of UN for the sphere of industrial development. Its activity creates conditions for many-sided utilization of the local raw-material basis for the production of building material in developing countries, for technical mastering of individual output and production processes of building materials, for their effective application, for the increase of qualification of workers and in this way for the development of production in these areas and for the increase of effectiveness of the investments. UNIDO has also a possibility to support transfer of know-how and experience between individual regional commissions and to contribute to the development of scientific research and technical development in these areas.

All these questions are subject of systematic care in the sessions of UNIDO. To many of these problems in the field of construction industry attention was paid at the International Symposium on Industrial Development in Athens in 1967, especially to these questions: Programming in Investment, further Technical development and rationalization, Use of Prefabricated parts and structures, further Standardization, modular co-ordination and typified (model) designs, further Research and development institutes, Training etc. From this symposium originated also some themes for a certain number of areas relating to the development of the construction industry in which UNIDO is in a position to provide technical assistance:

- Utilization of local raw materials (including agricultural and industrial waste products) for the manufacture of building materials and components;
- Feasibility studies of new and improved building materials;
- Improvement of traditional building methods;
- Partial prefabrication;
- Utilization of advanced construction techniques;
- Organization of building operations;
- Introduction of building control systems;
- Selection of equipment to increase productivity and quality control;

- Establishment of research and testing laboratories;
- Development of suitable design in specialized fields of housing and building;
- Rehabilitation and reconstruction following natural disasters;
- Training.

In the frame of international technical assistance, UNIDO has paid in accordance with its programme a relatively close attention to problems of the construction sector, especially of the production of building materials in developing countries and has been in the last years engaged in tens of operations in the value of many hundreds thousands dollars annually in order to form conditions for the development of the construction industry in developing countries. At the same time, and in pursuit of this activity, UNIDO pays attention to the cooperation with UN commissions, especially ECE, ECA, ECLA, ECAFE etc. and seeks - in the frame of its competence - to help these commissions.

In a more detail we handle the activity of UNIDO in the special part of this study.

As to the activity of individual regional economic commissions it is possible to mention e.g. the activity of ECAFE working with its secretariat approximately 20 years. Its first report on Building Materials and on Construction Methods in Asia and the Far East was issued in April 1955 and was a basis of negotiations on the third meeting of the Inter-Secretariat Working Party on Housing and Building

Materials held in Bandung, Indonesia in 1955. From this time, seminars, sessions, consultations and meetings were held dealing with these problems and realizing conclusions and resolutions of the previous negotiations. In the frame of ECAFE and in some countries, e.g. in India in New Delhi work Regional Housing Centres solving above all specific national and territorial problems in the development of construction production and of production of building materials and supporting the development of national economics.

Great attention is also paid to questions of housing building in view of the fact that the lack of flats in Asia is still more pressing than in other parts of the world.

Methods and means how to tackle this problem are in various countries very different and depend on their economic level reached so far.

At the same time, the situation in building materials which is the key development problem of construction is specific in every country. ECAFE has paid considerable attention to international technical assistance to individual countries. With the help of ECAFE and its regional agencies questions of building materials for the building of houses have been tackled and experiences in this field have been evaluated and transferred. Particularly effective

appeared the cooperation of the ECAFE agencies with the governmental agencies in some countries for the introduction of some elements and materials into the construction and for the realization of their production. The necessary development of the building production and of the construction calls in most countries for a concentrated care and for a construction of a sufficient capacity of factories producing building materials in the necessary assortment. Even if the utilization of old traditional building materials is in all ways supported ECAFE and its regional agencies seek assistance in introducing new building materials, chemical materials in the construction itself, and in fitting, heating, illuminating and other works. In expert publications, seminars and other meetings considerable attention has been paid to the prefabrication. Prefabricated parts from traditional materials, metals and synthetic materials which are in the world usually used as elements can also in most countries of Asia and Far East effectively contribute to the development of construction.

Considerable attention has been paid also to questions of construction in connection with the implementation of economic plans that have been in many countries worked out. It appears that in many countries the lack of building materials has been one of the main causes for nonfulfilment of intentions in the development of housing construction.

At the same time, the assortment of the construction production is not always favourable for the implementation of economic plans. The meetings of the ECAFE commissions have drawn many times the attention to the necessity of standardization and modular co-ordination as a necessary basis for the structural reconstruction of the building materials production and of the construction production in general and for the substantial increase of productivity in these activities.

In connection with these problems great stress has been laid upon regional needs and peculiarities. Therefore, in the materials of ECAFE attention has been paid to urban planning. These problems were subject of a seminar in 1966 in Japan.

ECAFE has paid attention to the establishment of national research institutes. Equally the resolutions of some seminars and meetings recommended to the governments of Asia and Far East countries that they promote establishment of industrial research association laboratories by well organized industries such as cement, plywood, clays, plastics etc.

ECAFE further paid attention to socio-economic studies like e.g. to questions of Economic Significance of Housing Investment, Housing Finance and Fiscal Policies, Employment in Construction, Administrative and Legal Aspects of Housing, Housing and Building Activity, Land Problems.

At the same time ECAFE agencies have paid considerable attention to the information and popularization activity in the field of methods of utilization of building materials. It appears, namely, that - as to the ECAFE activity - there exists knowledge of these problems but that it is necessary to pay great effort to its publication in a instructive way in order that it may be used and utilized in practice. As most competent proved such popularization and educational forms like permanent exhibitions, enquiry and information service, organizing demonstrations, lectures and seminars, providing documentation, film, library services, photo documentation, publication programmes and also promotion of trade training and application of building knowledge.

Great stress has been laid by ECAFE upon the establishment of building centres in developing countries. The centres in developing countries, after they had been established, devoted attention to regular publicity and preparation of building trade directories which would promote regional trade in building materials.

In the past many countries imported most of modern building materials from abroad. Their non-delivery meant always a serious affecting of tasks in the intentions of construction in the frame of economic programmes of individual countries.

For this reason ECAFE and its regional agencies pay attention to problems of establishment of modern industry of building materials in individual countries. In connection with it problems of building constructions and methods of construction are being dealt with according to the requirements of a modern building.

At the same time ECAFE paid also attention to costs of housing building, first of all in relation to the used building materials and construction systems. The difficulties of studies dealing with these problems are increased by differences in the nature of items constituting the building cost and by variations in the cost of many items - resulting from local conditions in the building industry of the countries and of the regions. The point of ECAFE was that in spite of these variables a study of this nature would be useful to housing experts and would help them to reduce costs in their countries. A series of information, data and indices has been worked out and given to ECAFE countries. Also were worked out surveys and analyses of housing and building materials in these countries and on the basis of different situation in individual countries basic development possibilities and tendencies were laid out. It is essential to ^{be} concerned in the complex of production factors with raw-materials and materials for construction - above all - of houses but further of industry, engineering network, transportation facilities and others.

As regards other production factors, in many countries there is a lack of qualification - of qualified workers of all categories for the management and carrying out of the construction.

A faster development of construction is in many countries slowed down by the insufficient communication network. The development of transport is a condition for the development of all other branches in these countries, above all of industry. Particularly important production factor enabling a fast development of construction and productivity is the progressing mechanization by way of mechanical machines and implements as well as of big construction machines corresponding to the needs of production in the modern industry of building materials and in the construction production. ECAFE will successively work out these problems in the future and help to solve them according to conditions and needs of individual countries in the region.

Considering that we have dealt with some aspects of the activity and of international assistance of this commission in detail and that many features are characteristic for other commissions too we shall not repeat them and would describe the activity of other commissions in a shorter form.

Great attention to questions of housing, housing building and housing production in general is paid by ECA. It concentrates, first of all, on problems of development of housing, on solution of housing building and of development of management and organization of construction building and on construction materials industry. In the last years attention has been paid especially to questions of factors concerning housing administration in relation to current housing problems and government policies. These questions have been solved in close relation with the development of plants. At the same time, it appears that special conditions for housing building in individual countries do not obstruct the international cooperation and, on the contrary, they will call for it in view of the need of effective formation of the construction sector and of the building materials industry. For this reason, ECA pays also great attention to international cooperation in these fields.

An important role in the development of housing, housing building, construction sector and building materials industry have the governments of individual countries that can give and in fact give an effective support to the work of ECA.

Important is also the care of ECA to the development of research, to coordination and popularization of research and rationalization activity in the sphere of construction and construction industry. In this connection ECA in a series of reports calls the attention to the important role of designing and leading the projects not only in the direction of the construction which will be realized in the near future but also for the perspective. In this field too, attention is paid to international cooperation.

In a series of materials ECA and its secretariat equally points to the need of a more extensive utilization of local raw-materials and material resources that the African countries possess. In these and in other spheres (e.g. urban planning etc.) ECA organizes the exchange of know-how and experience, the generalization of most progressive knowledge and their publicity.

Equally, like in other developing countries, in Africa also exists an objective tendency of a broader assertion of new construction systems, of typification, of new construction technologies, mechanization and complex mechanization, of new production processes etc. In conformity with these tendencies ECA will evidently develop its further activity and, like now, will provide the transfer and use of know-how from industrially developed countries of the world.

ECLA which helps the economic development of Latin American countries pays systematic attention to the solution of problems connected with housing, construction of flats, construction sector and development of building materials production in individual conditions of particular countries of this continent. Different demographical, climatic and economic factors precondition in a relative degree development tendencies of the construction industry especially as to building materials, construction technologies and prefabricated construction components. The comprehensive material on housing policies and programmes in Latin America in the 1960's has been submitted by the Secretariat of ECLA.

ECLA elaborated a series of reports, organizes seminars and other working meetings where it has been stated that most of Latin American countries lack a definite housing policy.

In connection with these problems ECLA pays great attention to town planning and the siting of housing projects in town.

In all these spheres ECLA pays attention to international cooperation, especially to exchange of know-how and experience in the field of construction sector, prefabrication, building materials production etc. Different level of various Latin American countries in the field of construction of houses, cities etc. enables

to make use - apart from the know-how the experience of Europe and USA - of many new methods from those countries of Latin America that have developed construction sector and housing and infrastructure.

The industrialization of the construction sector, especially the introduction of prefabrication in developing countries calls for initiating standardization, typification and unification in the construction sector not only in basic construction works but also in finishing works. These principles must be applied already in the design so as to secure modern construction in the whole complex of production factors.

As in other developing countries, ECLA lays a great stress in these areas upon cooperation with governmental agencies of individual countries that may support the implementation of progressive projects and solutions of technical, technological and economical nature.

In the sphere of building materials production, prefabrication, mechanization of construction and of initiating progressive construction systems also in the future great role will be played by international cooperation in Latin American countries which will be a main concern of ECLA.

Great attention to questions of housing building and planning has been paid since its foundation in 1947 (as a first regional commission) by ECE. The committee for these problems was established already in 1947 and is one of the oldest agencies of ECE. The importance of its activity was accentuated by the need of an extensive after-war reconstruction in Europe and by the tasks of new investment in the sphere of housing and of all branches of economy) that were linked with the need to develop the construction production and the building materials production.

In the beginning period the committee contributed to exchange of experience in the field of development of the construction sector and of the increase of its capacity and productivity. Later attention has been paid to the exchange of experience and information on the development of production of economically advantageous building materials and technologies and their use in the construction sector. At the same time, the initiative was evolved to the achievement of international standardization and modular coordination of size and feature of building components and materials, of the harmonization of building rules and codes between countries and on this basis of the development of international trade and cooperation in the field of building materials and construction equipments in general. Results of work

in this sphere (two meetings of specialists in 1959) were summarized in a report which was extensively used by experts in the construction sector in the European and other countries. Great attention has been paid to housing policy in Europe, to surveys of housing situation in European countries (to this aim unified definition of statistical terms have been worked out).

In the period of fifties a certain attention was also paid to prefabrication but the final result still was not remarkable because it was the beginning of prefabrication.

In sixties - based on the analysis of the housing situation - great attention was paid to the linking of housing policy with the whole social and economic development, with physical planning and with the policy of environment; at the same time, attention was paid to the assistance to less developed countries.

In the sphere of development of building materials and of the construction sector and as a result of a more comprehensive approach ways to the increase of capacity and effectiveness of the construction sector were searched; the aim being, at the same time, to contribute to a faster making use of new techniques and new technologies in this field. On this problem a special seminar took place in 1964 in Prague.

Equally great attention has been paid in all fields to the development of research in the construction sector and to the exchange of experience. Later steps have been undertaken to the development of a broader cooperation in the construction research and a survey of organizations for the construction research was published.

At present first -rate attention is being paid - following achieved results - to the relations between economic, technical and social development and the environment and, at the same time, after the quantitative problems have been solved to many qualitative problems. Further questions of progressive methods in the organization and management of the construction sector are being dealt extending, highly effective industrial methods in the production of building components and in works on the building plot and questions linked with international cooperation and trade in the construction sector.

Subject of concern are further problems of development of towns, of physical planning in the context with transportation systems, of development of leisure areas etc.

ECE participated in many actions of assistance to developing countries and many of its materials contributed to better orientation in these problems in developing countries.

The activity of ECE deserves attention also as to the experience of its work because at the beginning of its activity the level and situation in many European countries was very low and the key sector for further development was especially the construction sector and building materials production. Its experience, therefore, is remarkable also for other UN agencies and commissions and also for many developing countries.

Apart from these agencies and commissions great attention to international technical assistance has been paid by other agencies, e.g. UNESCO, ILO etc.

In the frame of ILO, e.g., to some of these problems attention has been paid by Building, Engineering and Public Works Committee. It deals especially with socio-economic aspects of the construction activity and of the work in construction linked with technical progress etc.

Attention to international cooperation and further questions in the construction sector and in the building materials industry is paid also by many governmental and nongovernmental international agencies and organizations.

Generally - taking into consideration the activity of different above-mentioned commissions and agencies - it appears that their activity in an important manner contributes to the development of the construction sector, construction industry and of building (especially housing building) in developing countries. Their activity has

enabled to solve these problems according to specific needs and conditions of individual areas and has formed pre-conditions for the fast progress in this sphere in countries of Europe and in developing countries of Asia, Africa and Latin America. These agencies pay great attention also to international cooperation and initiate the widespread application of progressive technical, technological and organizational experience. In all commissions increasing attention is also paid to questions of typification and unification, to the management of the construction process and its economical and financial aspects. At the same time great interest can be seen in linking these questions with the system of development programmes in various countries, with physical plans etc. This link creates preconditions for a more proportional solution of development and territorial problems.

All these agencies pay, at the same time, great attention to the evaluation of know-how and experience of individual countries, to the publicity of the best experience and to the utilization of know-how and experiences from developed countries and, simultaneously, to the international cooperation in this field.

With the increasing activity of these commissions and agencies common elements and problems increase that can be solved by integrated activity of all commissions and agencies. For this reason it will be necessary in the future to pay first-rate attention to common solutions

of some problems and questions and to common activity in a series of questions of international cooperation (through common seminars and symposia or other measures) so that ever more effective conditions for the development of the construction sector, of the construction industry and of the building in developing countries may be formed.

3. INTERNATIONAL ASSISTANCE PROVIDED BY UNIDO

The activity of UNIDO up to now has been concentrated especially on international technical assistance (elaboration of studies and projects for developing countries, providing experts and technical assistance to developing countries on the introduction of building materials production and on the development of the production technology, providing expert assistance to geological survey of raw-materials for the building production, organizing research missions on the production of building materials, elaboration of technical and economic reports concerning possibilities of development of production and commercial utilization of building materials, training of experts from developing in developed countries, organizing symposia, seminars and working meetings to some problems, exchange of experience from many problems in developing countries, advice on the quality of production etc.) to the development of building materials production.

This activity supported mainly ways of utilization of the existing natural resources in developing countries and as to the construction sector especially of local raw-materials for the production of building materials etc.

It has been concentrated, firstly, on the sphere of the utilization of raw-materials for the production of cement, ceramics, pottery, products and baked clay, for the production of asbestos and asbestos-cement products, output and processing of marble, testing of raw-materials and of quality of products etc. At the same time, care has been paid to the building materials and construction components production, to the utilization of light building constructions and elements to the prefabrication of construction elements, the technology of glass production, the output and processing of decorative stone, application of plastics in the construction sector, the development of construction industry etc.

Attention has been paid also to economic questions, to the production of building materials and of construction system, to the financial questions, to the management etc.

Special attention has been paid to the development of research, especially to the exchange of experience between representatives of research organizations in the sphere of construction research and in some other spheres, e.g. building materials etc. Further a series of studies and pilot projects dealing with problems of

building materials and components production have been worked out and possibilities of utilization of various kinds of materials, e.g. silicate have been analyzed.

One of important and indeed exceptional projects in the last years was destined for Bolivia. It was the pilot plant for the production of asbestos. Its aim was to handle the production and to stimulate development investments for the production and use of asbestos, for national needs and for exports. This many-years project supported by UNIDO/UNDP involved costs of several hundred of thousands dollars.

Totally, in last years in the field of international technical assistance UNIDO carries out a series of actions in the value of one million of US dollars yearly.

The value of individual actions amounts to several thousands dollars for the given country (in some cases tens of thousands and exceptionally hundreds of thousands dollars).

Totally, for individual continents the volume of this aid varies from 100 - 500 thousands dollars and is essentially lower than in some industrial branches, e.g. in metallurgy (where it is doubled), in the chemical industry etc. As to the time element, most of actions are realized during one year, only exceptionally bigger actions take place during more years.

It is apparent that mostly these are actions of minor importance, very limited and dispersed and that these actions can only partially contribute to the development of the sector in developing countries and thus to the industrialization of these countries.

The result of the analysis is that into the future it will be useful to make further progress in the whole concept and structure of technical assistance provided by UNIDO in the field of construction industry. It has to be more purposive and concentrated in order to contribute in a more effective way to the economic progress and to the industrialization in developing countries.

From the analysis of the whole assistance it appears as purposeful for the future:

- to affect increasing of the portion of financial means in the frame of the UNIDO working programme to the sphere of construction industry because this industry has through the investment construction a decisive influence on the process of industrialization in developing countries and on the increase of living level of the population in these countries;
- to affect concentration of these resources on more comprehensive projects that would more expressively contribute to the development of the construction industry in individual countries and would have more

remarkable influence on the economic development of these countries;

- to pay attention, at the same time, to more perspective projects that can, in a longer period, help direct the construction industry in individual countries and thus contribute more effectively to economic changes in developing countries;
- to concentrate more the assistance of UNIDO on the preparation of development of production processes in the sphere of the construction industry so that the technical assistance may find following materialization in the development of the construction industry in developing countries.

Such an orientation realized in close coordination with UNDP, regional commissions and developing countries would enable to influence more effectively the development of the construction sector and of the construction industry in developing countries and would contribute to the acceleration of the industrialization process in these countries.

4. PERSPECTIVE ORIENTATION OF THE INTERNATIONAL

TECHNICAL ASSISTANCE

The up-to-date providing of international technical assistance has been concentrated in principle on various fields of technical, economic, financial and management processes in the construction industry.

In the future international technical assistance will continue to have a great importance. After all, in all sectors of raw-materials output, their processing and utilization in a quick way technology and technique are being developed which are highly effective but which calls for expert and qualification knowledge. In the construction production new and more perfect constructions find use based on a high degree of prefabrication and assembly-manner of building, on complex mechanization, progressive forms of organization of labor and construction and on modern scientific and technical knowledge. In the future, therefore, it would be purposeful to lay first-rate stress in the international technical assistance on mastering the whole complex of production factors that in a most important way influence the effectiveness of the production process in developing countries.

This international technical assistance should affect:

- a) all basic elements of production factors, especially of modern technology, further the technique - technically perfect machines, equipments, aggregates and automation technique (apparatus etc.), further the modern raw-materials basis (e.g. raw-materials with high technical parameters), and high technical level and quality of products for the construction etc.,
- b) all basic phases of the process of the building materials process and of the building production beginning with the search, survey and output of raw-materials to their processing to building materials and launching of this production up to the use of these materials in the construction or in the production of building components, prefabricates and their completion in the construction;
- c) basic areas of building materials according to local conditions of developing countries, e.g. utilization of the silicate basis, wood substance and of other local materials, utilization of chemical materials, steel and non-ferrous metals etc. in the process of building.

Further, of importance is the assistance in the formation of scientific and research basis in developing countries where the necessity of its building on a certain development degree will objectively arise. If, at present, the international technical assistance deals especially with technical processes in the production, in the future, it will have to have as its object creative processes in science and research. Of great importance will be also the dissemination of scientific and technical information.

In some cases the international technical assistance can be directed also to the mastering some licensed productions that can be introduced in developing countries. The introduction of licence means technical and technological mastering of the whole process, of the basic raw-materials and materials, the quality and precision of produced elements and components and a series of questions connected with the application processes. Licence production can enable to quickly introduce and master whole construction systems and implementation in the investment construction in production spheres as well as in housing and infrastructure.

The decisive factor will be in the production process and in science and research workers, their qualification and ability to master demanding and highly comprehensive processes. For this reason international technical

assistance will have to be concentrated on the qualification of people in the production, on the knowledge of modern technology and techniques in various production processes and on the development of scientific and research activity in developing countries.

If the level of developing countries is to reach the technical standard of developed countries, international technical assistance has to count with decisive perspective directions of the scientific and technical development in the construction sector. In general, the evolution leads to the development of more perfect buildings based on better raw-material and material basis, with better technical parameters, and enabling to build more quickly and economically with lower costs of purchase, of maintenance and of repair of buildings and with lower running costs.

General tendency of scientific and technical development in the construction sector and construction industry leads to further industrialization of the production, to a more perfect and extensive mechanization, to introduction of new products that would accelerate technological processes and diminish costs on the plot, especially at finishing, maintenance and modernization of buildings and to prefabrication of installation elements and optimally completed systems of construction parts.

Attention should be paid, firstly, to the improvement of use features and technical level of buildings and constructions, to achievement of better heating, technical and acoustic features and optimal values of building. To achieve this, non-traditional constructions will be used, technical standards will be improved and typification and unification of construction components will be developed; further, unification of technologies and machinery equipment for the production of components and construction, their transportation and assembly will be developed.

Of great importance in this connection is the industrial prefabrication and, firstly, the prefabrication in the sphere of silicate a metall basis which enables to make a remarkable progress in the industrialization of the construction sector. To this will contribute also more extensive use of steel constructions, of modern chemical and other materials and, further, more extensive assortments of production of components and installation completes of the light prefabrication. Of great importance in this connection is also continuously more extensive specialization going i.a. to the concentrated prefabrication of construction installations and technical equipment of buildings and other products. Extended will be also the space prefabrication enabling further economy of assembly works.

As to the development of construction technologies, tendency will probably lead to higher possibility of detaching construction processes from the building plots and to making use of more mobile, more efficient and more reliable machines and equipments. To this should contribute also more perfect construction systems of building linked with suitable raw-material and material basis and using a bigger share of completion and prefabricated components. In this connection more extensive application of modern assembly - manner of building will take place.

As to the building materials production, general tendency will evidently lead to the use of better building materials with high parameters, to the higher share of nonsilicate materials, to the growth of capacities and equipments for the production of these materials and to the more extensive automation. At the same time, a series of technological changes will be realized enabling to decrease the costs of production of these materials.

In technological, technical and construction progress in the construction sector it is necessary to count for the future with a more extensive scientific and technical cooperation between individual countries which enables to concentrate intellectual and material forces for the solution of decisive problems and to increase the effectiveness in the construction sector and in the construction industry.

All these tendencies should take into consideration the international technical assistance according to the conditions of individual developing countries so that the process of development of building industry in developing countries may take place in accordance with tendencies of scientific and technical development in this sphere and that it may contribute to the economic progress in these countries in harmony with their development programmes.

5. INTERNATIONAL COOPERATION IN THE FRAME OF
INTER - STATE AGENCIES

Problems of scientific and technical cooperation and of technical assistance in the construction sector and construction industry are subject of attention of many inter-state agencies and organization, e.g. CMEA (Council of Mutual Economic Assistance), OECD etc. In this study some achieved results and targets in this field in the frame of CMEA are dealt with.

Cooperation of member states of CMEA in the construction sector is realized, first of all, through the Standing Committee for Building the activity of which brought in 15 years of its existence extensive results in the technical and economic progress of building in individual countries of CMEA.

The task of the Committee is to contribute through multilateral economic and scientific and technical cooperation to the planned development of the construction sector and of the building materials industry, to accelerate scientific and technical progress, to decrease construction costs, to shorten time of construction and to increase the whole effectiveness of construction. In its activity it respects the natural and economic conditions of individual countries, contributes to the coordination of development plans of the construction sector and of building materials industry to the scientific and technical cooperation, to the formation of a unified normative basis, to the improvement of management in the construction sector, to the exchange of scientific, technical and economic information in the field of construction sector etc.

As to the contents of the economic, scientific and technical cooperation, it pays attention practically to all fields of the construction industry and spheres connected with it, especially to questions of building materials development, of glass and ceramics industry, to construction-assembly works and to the construction production, to building design, to problems of construction of cities and physical planning, to exchange of information on construction etc.

The importance of this Committee follows from the fact that the investment construction in the production and in the sphere of housing and facilities plays in the economy of every member of COMECON a great role. Considerable means are spent on this construction and the whole activity of the construction sector in an important way influences the effectiveness of the investment construction and of the whole national economy. Of decisive importance for this process is the industrialization of construction industry and qualitative changes in raw-material and technical basis of this branch.

Great importance was therefore attached to introduction of progressive technologies in the construction of buildings and facilities and of highly productive processes in the production of basic building materials. Accordingly, technological schemes and projects of large-scale capacity technological lines for the production of decisive construction materials, e.g. cement, porous concrete etc. have been worked out. Characteristic feature of these lines is a considerable decrease of consumption of labour, material and energy - in some fields e.g. the productivity of labour is increasing ^{or more} twice the present state and investment costs decrease.

Great attention is also paid to new construction systems, especially to the use of combined building constructions containing metall alloys, plastic and further materials.

An important subject of concern of the Committee is to achieve high level of mechanization of building and assembled production, use of monolithic concrete at the construction of industrial and housing buildings, large panel housing buildings etc. Equally important is the mechanization and progressive machine systems in ground, concrete, assembly and finishing works.

First-rate importance for the economy of investment construction has the unification of projects for a series of buildings applying light and effective materials, components and whole constructions.

Further important target which is subject of long-term attention and where a series of positive results have been achieved is a normalization activity, especially elaboration of principles of a unified system of modul size coordination in the construction sector etc. These works condition a more extensive specialization and concentration in the construction sector. Important is also that care is paid to the environment and in this connection to the rationalized urban principles for the protection and formation of the environment in towns.

The work of the Committee pays, at the same time, great attention to questions of international technical assistance to the development of the construction sector and of building materials production in all countries and to transmission of progressive technological, technical and production experiences between countries in order to increase technological and technical level in this field.

Systematic stress is also laid upon specialization and cooperation of technical equipments for the furnishing of buildings, e.g. lifts, central heatings, air-conditioning etc.

Great importance also has specialization and cooperation of production of light constructions for industrial, warehouse, agriculture and facilities buildings with the aim to achieve considerable decrease of building materials consumption per unit and consequently decrease of building costs and of production of individual components costs.

Apart from the Standing Committee for Building the problems of economic, scientific and technical cooperation in this field are dealt with in contiguous spheres some other agencies of CMEA. As to machinery systems for the construction sector and to technological equipments for the production of building materials great

importance has the activity of the Standing Committee for Machine-Industries which organizes specialization of production in this field. Similarly, it is in connection with the chemical industry, in the research and production of chemical materials for the construction sector, in the relation to the Committee for Transportation when solving problems of construction of highways etc.

In general, great stress is laid upon international cooperation in science and research and upon specialization in research tasks and utilization of licences.

At the same time, the Standing Committee for Building pays attention to perspective targets, especially to possibilities of growth of the construction sector and of building materials production in individual countries in relation to natural and economic conditions.

Problems of further development of economic, scientific and technical cooperation between socialist countries are dealt in the Comprehensive programme of further intensifying and improvement of cooperation and development of socialist economic integration of CMEA member-states which was approved on the XXV. session of CMEA.

In this programme development of cooperation is presumed especially in the field of increase of technical level of the building materials production and furnishing of the building production with main building materials, products and constructions. Further, cooperation is presumed in introduction of new technologies in the con-

struction of buildings and also cooperation in design.

Scientific and technical cooperation ought to be concentrated especially on the evolution of modern technologies of cement asbestos, cement products and light building constructions and new perspective building materials. Special attention will be paid to the application of experimental automatized technological lines for the production of basic building materials. Together with the introduction of new technologies in the construction a more extensive use of complex mechanization and automation is presumed.

Scientific and technical cooperation and specialization does not involve only the construction of standard buildings but also special constructions, e.g. undergrounds, long-distance conduits, highways, cooling plants, buildings of big widths, etc.

At the same time, great attention is paid to typification and unification of some buildings and building components in order to achieve higher effectiveness in the building sector.

The comprehensive programme pays also an important attention to technical assistance and more intensive development of science and of technical progress in some countries, especially in the Mongolian People's Republic. It presumes that individual CMEA memberstates will render many-sided assistance to the development in this

republic in the field of geological survey and in sending experts to MPR, training Mongolian experts in other countries, formation of their own scientific and technical potential etc.

This assistance - taking into consideration considerable raw-materials resources of Mongolian People's Republic and vast development tasks connected with the investment construction - will in a great manner involve the construction sector and building materials production.

From the character of this cooperation it seems evident that it is concentrated on decisive questions and problems of development of the construction sector, of the building production, of housing building etc. For this reason, it will be in the future useful to cooperate more closely with these organizations when assisting the developing countries and support a faster progress in this field in developing countries.

6. RESOURCES AND POSSIBILITIES OF ČSSR IN

THE INTERNATIONAL TECHNICAL ASSISTANCE

In the last 25 years, ČSSR has built up a relatively extensive construction sector and construction industry the know-how and experiences of which can considerably contribute - with necessary regard to local conditions - to developing countries.

Fast development of the construction sector realized in Czechoslovakia thanks to state direction contributed in an important way to the implementation of investment construction and to industrialization of Czechoslovakia and namely of Slovakia. Performed construction investment in the national economy have increased since 1948 approximately **eight times** and have formed preconditions for the successful development in all branches of national economy. The Czechoslovak construction sector contributes to a high level of accumulation and of spent investment resources in the national economy both in the production and in the housing and facilities building sphere. In many sections Czechoslovak construction sector achieved world level.

In the last 25 years the industrialization of the construction sector has considerably proceeded, especially prefabrication (e.g. the number of produced prefabricated silicate building components reached in last years approx. 4,8 millions m³ of concrete, iron-concrete and prestressed components yearly).

The industrialization of the construction sector has considerably contributed to the growth of effectiveness of this sector. In the production of prefabricates on 1 inhabitant USSR takes first place in the world.

The degree of industrialization is given e.g. in the housing construction by the fact that from the total number of flats built by enterprises of the Construction Ministry about 85 % is from whole-assembled panels, further 8 % is built from panel blocks and the rest is built in a more or less traditional way. The Czechoslovak construction sector successfully builds not only standard but also special buildings e.g. water-dams, high stacks, towers, poles, underground, highway network, gas-conduits and pipelines etc.

The degree of industrialization is also given by the fact that in construction enterprises about 4 million m³ of construction components are used and the degree of mechanization by the fact that mechanization of groundworks surpasses already 90 % (and the complex mechanization 70 %), complex mechanization of concrete works is about 60 % etc.

Equally, fast development has been noticed in the production of building materials and in the technical level in this sphere. In comparison with 1955 e.g. total production of the building materials industry increased about 4 times and very dynamic was the production of various building materials. The production of cement, e.g., increased from about 1,65 million tons in 1948 to about 8 million tons in 1971 and reached about 550 kg per one inhabitant - in this way ČSSR has ranged among 10 countries in the world with the highest production in this sphere. Production of bricks increased from 1,2 million units in 1948 to 2,4 million in 1971. These two relations characterise not only high dynamics in the production of building materials but also considerable structural change to prefabricated concrete components.

At present, ČSSR produces about 2,3 million tons of lime, about 7 million m² of facing ceramics, about 4,4 million m² of ceramic tiles and carries about 24 million m³ of natural stone etc.

As to industrialization it produces - as has been already shown - about 4,8 million m³ of concrete, iron-concrete and prestressed concrete, building components produces more than 1 million ties (sleepers) from iron-concrete and prestressed concrete, further asbestos-cement roofing, pipes and stone tubes, sanitary ceramics etc.

In this production favourable technical and economic parameters are reached. Experience from these processes and know-how of ČSSR can contribute to the development of production in developing countries.

ČSSR also created in the field of construction sector a relatively developed research basis that deals - in scientific and technical cooperation with other socialist countries and in conformity with the findings of science and technique in these countries and in cooperation with research in other countries - with decisive problems of scientific and technical development in the construction sector.

In the Czechoslovak research basis work, at present, about 6 thousand workers; further large teams of experts work in the machinery - industry and deal with machines and equipments for the construction sector and building materials production, in the chemical industry etc.

From most important state directed research institutes,
let us mention e.g.

- Building Research Institute, Praha with about 1500 workers which has also branches in other Czechoslovak towns.
- Research Institute of Building Materials in Brno with very modern equipment deals with problems of the development of production of various building materials.

- Institute of Civil Engineering in Bratislava dealing with research of various engineering constructions.
- Research Institute of Building Economy in Bratislava dealing with questions of economy, management and planning of construction production in macro- and micro-sphere.
- Research Institute for Mechanization and Automatization of Production of Construction Components in Prague.

In ČSSR, great attention is also paid to the process of building and architecture, especially to housing building. With these questions has dealt for already twenty years the Research Institute for Building and Architecture. It is a technical and social science organization.

The main mission of the Institute is concerned with the research in the field of the development of socialist living environment, created by capital construction, architecture, urban renewal and physical planning, including the reconstruction and completion of the settlement network. Apart from the research in the given field the Institute performs still a number of other activities, particularly:

- offers technical assistance, specific reports, expert evidences, analyses and similar activities for central authorities;
- elaborates thematic studies and suggestions concerning the practical application of the results of the basic activities of the Institute;

- within the framework of its activities organizes training courses, seminars, lectures and special forms of study for research workers, project engineers, investors and managers;
- develops international cooperation with the institutes of analogous character in other countries;
- participates by its experts in the activities of various governmental and non-governmental international organizations and their bodies, prepares working materials for the consultations, performs consulting and expert activities. This field of activities concerns particularly the CMEA, UNO, C.B, IFHP etc.

Apart from centrally directed institutes operate other various institutes directed by individual General Directories and enterprises. These are e.g. Institute for Ceramics Refractories and Raw Materials in Horní Briza by Plzeň which deals with research of technologies, machines and equipments in this field. This institute is subordinated to the General Directory of Czechoslovak Ceramics Works in Prague.

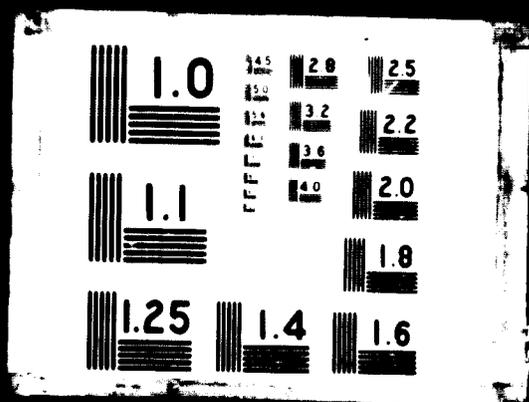
Analogously, qualified engineering and desing institutes in ČSSR have been built up for designing various buildings and productions. In the field of construction sector and building materials these are, e.g., State Institute for Designing of Building Materials Industry Plants and Ceramics



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"KERAMOPROJEKT". Further specialized institutes for design of buildings in individual sectors exist, e.g. in energetics, chemical industry, metallurgy, machinery industry, in consumer, food-stuffs-industry, in agriculture, transport, communications etc. In these state design institutes in total some ten thousands of workers operate managed by outstanding experts with international experience.

Further several consulting engineering organizations have been built up dealing with questions of organization, rationalization and management in the construction sector, e.g. Institute for Rationalization in the Building Industry which has also branches in the rest of country.

In Prague operates a Building Information Centre which is a central information agency in the field of scientific, technical and economic information for the construction sector and for the production of building materials.

Of great importance in the solution of investment construction, construction sector and environment in the work of architects. Because we consider architecture an interdisciplinary branch the architect gets to the position of a coordinator of many solutions concerning investment construction, construction sector, environment etc.

In Czechoslovakia architects are associated in two national associations - Association of Architects of ČSR and Association of Slovak Architects. Both these organizations (the first having more than 1000 members, the second nearly 700 members) associate outstanding Czech and Slovak architects with extensive international experience.

Working programme of the Associations of Architects is based on and directly linked with the tasks of economic development plans and supports the achievement of their targets.

Associations of architects laid out as a target to turn their attention, firstly, to the areas with most extensive investment construction. Part of both national Associations structure are expert commissions dealing with and assisting in solutions of actual questions of construction, housing, transportation, leisure etc. These commissions present proposals which are - after having been taken up by central committees of associations - submitted to governmental agencies.

Czechoslovakia has further gained experiences in planning and management of construction, in typification and unification of construction elements and buildings, in physical planning etc.

The Study and Typification Institute, Prague, is a specialized institute for the development and typification (standardization) of residential buildings, buildings for pre-school and school education, buildings for communal facilities and the technical amenities of housing estates and settlements.

The activities of the Institute in the afore mentioned fields comprizes:

- analyses in the field of capital construction and technical construction policy,
- research and development problems of the design of structures of system-built buildings, particularly programming for computer-aided design,
- development and prognostic problems of technical and technological designs of structural systems of buildings of reinforced concrete, electrical installations, heating, ventilating, airconditioning and sanitary installations (plumbing, drainage),
- typification problems (typification instructions and typified - i.e. standard - designs) of the individual parts of above mentioned buildings and their structural systems on the basis of international (ISO) modular coordination (10 cm module) and the principles of flexibility of architectural design and planning as well as a long term (10 - 12 years) dimensional, formal and functional constancy of the basic structural components of systems,

- standardization in the field of architectural and structural design of the above mentioned types of buildings incl. the standardization of the contents, extent and graphic presentation of designs and standard designs.

The Institute has been active in the above mentioned fields for over 25 years, of which 15 years on an international scale.

Of great importance for the development of industrial and housing building and for the construction of towns and villages is regional (physical) planning. These questions are subject of concern in Czechoslovakia of TERPLAN.

Established 20 years ago, TERPLAN, Czechoslovak Institute for Regional Planning has worked out up to now hundreds of projects for the government, for different ministries, for local authorities and for international bodies. The scope of work covers a large field from regional development plans to all types of physical plans, always with the emphasis on industrial and other economic activities and taking into consideration natural, economic, technical and demographical conditions of respective territories.

Besides, some special projects and studies have been or are being worked out, e.g.

- Feasibility studies of location of particular industries (power stations, cement plants etc.)
- Prognosis of the settlement network in the whole country with a view to development potential of different areas or towns and the resulting housing policy,
- Studies on preservation and amelioration of environment affected by industrial development,
- Establishment of the integrated information system (data bank) for collecting, processing and utilization of all data relevant for development of particular areas.

The complexity of the institute's work requires cooperation of specialists of different professions (urban planners, architects, economists, geographers, demographers, specialists for transportation, water and energy supply etc.). Furthermore the design capacity of the institute has a profound background in its own research work and in a close cooperation with other specialized design and research organizations in Czechoslovakia and abroad.

The institute has contributed to United Nations development activities. Its first work for the United Nations was the Pre-Project Study for the Development of Tourism in Tunisia, in 1966. Some of the experts of the institute participated in a few UN actions as consultants.

For the UNIDO the institute worked out the "Study for the Establishment and the Utilization of a Collection of Feasibility Studies by UNIDO" in 1970. This relatively short study proposed the classification of studies desirable to support the development of industries in developing countries. Furthermore, the study proposed the content of the respective type of studies, the method of cataloguing and classification of the collection, the processing of data presented by studies and recommended the utilization and dissemination of studies to users.

In the frame of its activity TERPLAN renders assistance to the Industrial Inquiry Service of the UNIDO and occasionally secured cooperation of other Czechoslovak specialized agencies. From 1971 TERPLAN participated in the important UN project "Master Plan for the Karachi Metropolitan Region."

This short outline of TERPLAN's activities illustrates a relatively broad scope of studies and projects with which the institute could contribute to the work of UNIDO. These could be location studies, analyses of the most suitable specialization of economic activities in a selected area of a developing country or in the whole country, the impact of a rapidly growing industrial centre (or of a new big industrial plant) on housing, infrastructure, facilities, environment etc.

Czechoslovakia produces also a series of machines and equipments for construction and building materials industry and has vast construction and technical know-how in this field.

The Czechoslovak construction sector sets itself great tasks for the future in the development of production and in the increase of its effectiveness and in structural changes and in the scientific and technical development.

The basic target is to decrease the material substance of buildings through the use of new constructions and materials, to increase the productivity, to accelerate the process of construction and to make use of new and more perfect technical systems and working methods. Further increase of prefabrication and complex mechanization of ground and concrete works is presumed. In the building materials industry of main concern will be the production of more effective building materials with qualitatively higher parameters, eventually of quite new building materials, further introduction of better technologies and automation of the production. Further typification of buildings and components and research activity will be developed.

All these facts show that CSSR has good qualification to contribute to the successful activity of UNIDO and to the industrialization of developing countries in this sphere.

Already in the past, ČSSR actively participated in the work of UNIDO and Czechoslovak experts helped in many countries to develop specific sectors of national economy and also the construction sector and the building materials industry.

Next year, ČSSR prepares a few-weeks technical workshop of UNIDO for selected experts from developing countries on questions of production of refractories.

Also for the future, ČSSR has many possibilities for transfer of know-how and experience to developing countries in the construction sector and in the sphere of building materials industry by organizing seminars or sending experts to developing countries, working out some studies and projects etc.

ČSSR, at the same time, is supporting an extensive scientific, technical and economic cooperation and integration with other socialist countries which multiplies its know-how and experiences and enables to progress faster in this demanding sphere.





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