OCCASION

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

DISCLAIMER

FAIR USE POLICY

CONTACT

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

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

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

05315

United Nations Industrial Development Organization

Distr.
LIMITED

ID/WG.148/4
31 July 1973

ORIGINAL: ENGLISH

Technical Meeting on the Construction Industry in Developing Countries

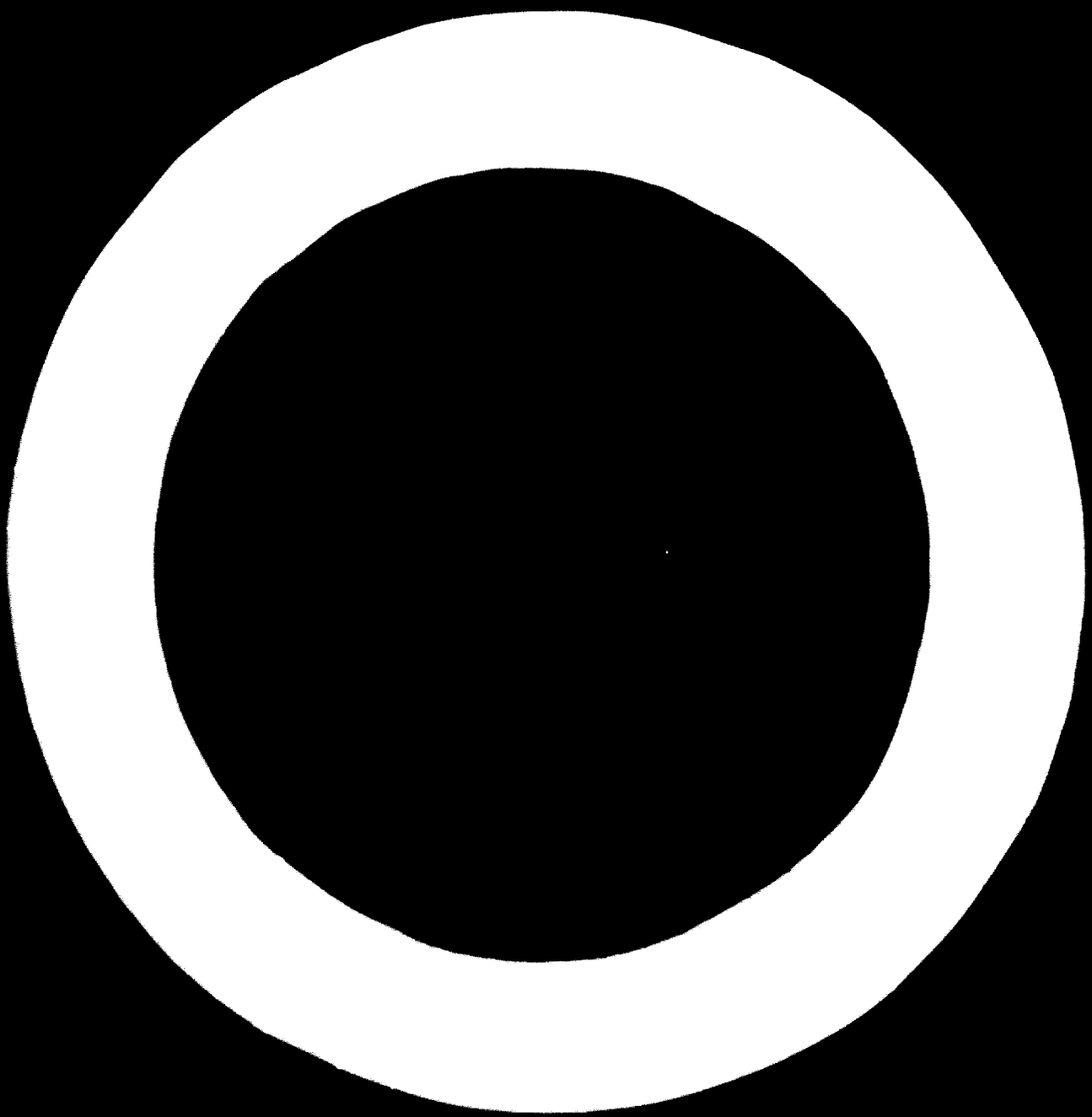
Vienna, Austria, 29 October - 2 November 1973

CONDITIONS OF EMPLOYMENT AND TRAINING IN THE CONSTRUCTION INDUSTRY IN DEVELOPING COUNTRIES

prepared
by the

International Labour Office
in co-operation with the
United Nations Centre for Housing,
Building and Planning

id.73-5678



CONTENTS

---

*This paper is based on a study carried out by the ILO in co-operation with the United Nations Centre for Housing, Building and Planning

I. The employment situation

A. Nature of the construction industry

As with any other industry the training needs in construction reflect the conditions in which the industry operates and its character. In developing and developed countries alike construction work tends to be carried out in a variety of conditions and to have special characteristics. Both conditions and characteristics may vary between countries at different stages of development. Aspects which are particularly relevant to consideration of vocational training for the building industry are discussed briefly below.

(1) Different sectors in the industry

In most developing countries the building industry is characterised by the co-existence of three sectors: a traditional sector, an intermediate sector and a modern sector.

The traditional sector largely forms part of the non-monetary economies of such countries. It is primarily concerned with the construction and maintenance by individual craftsmen of both urban and rural housing for the masses of the population and of other buildings. Many of these constructions are of poor quality and ill adapted to their purpose.

The intermediate sector consists of many medium-sized and small firms. Of the three building sectors, it is usually the largest employer of labour in developing countries. Firms in this sector are able to tackle projects of limited complexity, using mainly local skills, materials and techniques.

In many ways they are the backbone of the construction industry in the developing world and do the bulk of housing construction.

The modern sector plays an important role in the execution of large-scale infrastructural projects and urban development in countries in which modern technology as have already been introduced to a substantial extent. Construction in the modern sector may often be operated largely by international building contractors whose headquarters are in industrialised countries. In developing countries with a more rural bias and little industry, i.e. the majority, the modern sector plays a less important role and leaves more scope for the traditional and intermediate sectors. The relative importance of each sector thus tends to vary with the stage of development reached.

(2) Different types of technology used

The co-existence of modern, intermediate and traditional building sectors in developing countries means that a very wide range of building techniques are used there - from the most modern industrialised ones, with a high degree of mechanisation, to ones which are almost exclusively manual.

The most advanced techniques are used mainly in the modern sector; there is some mechanisation in the intermediate sector also. The latter tends, however, to make extensive use of labour-intensive work methods. Such techniques as standardisation and prefabrication of building components have been introduced to a limited extent in developing countries. The low volume of housing construction in these countries, often carried out by insufficiently trained contractors, and its concentration on small individual units or areas tend, however, to restrict their application and development.

As regards the traditional, largely non-monetary, building sector, the information available would not be conducive to the primitive traditional techniques. There has been little reduction of techniques from the modern and intermediate sectors except in the case of some pilot schemes stressing innovation in self help housing schemes and in the production of small infrastructural projects.

(3) Importance of construction in proportion to other branches of the economy

The greater importance of the construction industry in developing countries by comparison with industrialized ones is shown by the fact that as much as 50 to 75 per cent. at least of national investment is usually on building work.[1] There is evidence that, in countries with a particularly low per capita Gross Domestic Product (GDP) (US$ 200.00 or less), construction tends to account for a higher percentage of gross domestic capital formation than in other countries.[2] With the exception of agriculture, the construction industry tends to be the largest employer of manpower in the developing countries. The concentration of workers in the building industry is no doubt partly due to the extensive use of labour intensive methods in this industry.

(4) Instability of employment

The construction industry is, of course, one which is particularly prone to instability. This is due to several reasons, including the extreme susceptibility of the industry to economic fluctuations and periodical climatic conditions which prevent work outside.

1/ ILO Building, Civil Engineering and Public Works Committee, Seventh Session, Practical measures for the regularization of employment in the construction industry, Geneva, 1964, page 4.

2/ United Nations Economic and Social Council, Committee on Housing, Building and Planning, Industrialization of building, Geneva, 1965 (document E/C.6/36) page 19.

In developing countries this instability has a number of particular characteristics. Construction represents an intermediate stage between agriculture and manufacturing industries, providing recruitment employment for large numbers of unskilled workers thinking to move from rural areas to urban centres. The transitional or temporary nature of this employment is increased in many countries by the practice of people in many rural areas dividing their time seasonally between agriculture and work on construction. They frequently return to their villages, for instance, to plant and harvest the crops.

In addition, the jobs available in construction are intermittent themselves, because of the completion or commencement of individual schemes or projects. It has been estimated that, in Brazil, more than 70 per cent. of all workers in civil engineering either lose or leave their jobs every year, usually being taken back into the industry at a later time. The feeling of instability is increased by the frequent practice of hiring building workers only as day labourers. The workers concerned therefore have no job security and no great incentive to stay permanently in the industry.

(5) Attitude to work in construction

Work in construction carries little prestige for a number of reasons, deriving mainly from the conditions of work in the industry.

The firm is the hours worked in construction. Generally too few are worked per year and they are liable to fluctuation. On the other hand, delays are often compensated for by disproportionately long hours a day.

The absence of adequate wage differentials between low and high skilled technical occupations in construction is also a factor in reducing the attractiveness of work in this industry.

In addition, wages in other industries or occupations are often more attractive in developing countries than in construction; in particular, clerical workers may be able to earn considerably more than skilled construction workers.

In some countries recruitment practices are also a factor in reducing the attractiveness of work in building. Unskilled workers are often employed under traditional hiring systems under which they are forced to pay part of their earnings to their foreman in return for their jobs. The frequent practice of taking on construction workers as day labourers has already been mentioned.

The construction industry also tends to suffer from shortcomings in respect of social legislation including provision for social security. In many countries social legislation is very progressive but in practice it is not always applied to more than a limited number of industries. The construction industry is often excluded from practical application, partly because of the circumstances in which it is carried on. In addition, there are usually few labour inspectors who are qualified to work with the industry.

Difficulties of this kind are enhanced by the frequent lack of strong workers' and employers' organisations in these countries which could help to promote the interests of the industry and of the workers in it.

Another discouraging factor is the nature of work in construction. It is inevitably dirty and exposed to the weather; its safety and health hazards are high in all countries but particularly in developing ones where minimum protective standards are not always known by building supervisors, let alone enforced.

In view of these various negative elements the better educated job seekers with the potential for acquiring skills and reaching higher positions are not interested in taking employment in the industry. In general, the prejudice against it remains so strong that many potential recruits would prefer a lower paid job to working on a building site.

(6) Building standards and design

Building standards and design developed for industrialised countries are seldom applicable directly to developing ones, most of which are situated in the tropical and subtropical zones and have correspondingly different conditions (climate, local materials, etc.) from those in the majority of industrialised countries. Local building materials, such as timber, clay bricks and aggregates for concrete, are also frequently of poor quality. Training experts working in a large number of developing countries have reported that this poor quality makes it difficult to achieve sound standards of workmanship on site.

B. Demand for building personnel

(1) Demand for personnel

It is not possible, in the present state of manpower statistical and forecasting techniques to give comprehensive and fully reliable indications of what the demands for trained buildings workers are at present and what they are likely to be in the next few years. Available information, however, indicates that there is a need both for additional and for better qualified building personnel in developing countries.

Regional and global estimates suggest that a substantial increase may be expected to occur in the employment of building workers at all levels. Such estimates have, for instance, been made for Latin America. Under these estimates the construction force is expected to increase during the period from 1965 to 1980, from 3.7 to 7.2 million. The hypothetical composition of the labour force under the estimates would be: 450,000 professionals, technicians, administrators, managers and salesmen; 6,670,000 craftsmen and operators (860,000 skilled, 3,600,000 semi-skilled and 2,210,000 unskilled workers); 80,000 service personnel.[1]

Obviously such long-term forecasts are not very reliable. Mechanisation and industrialisation of building work and other productivity improvements, slackening of economic growth or changes in investment priorities may reduce the employment capacity of the industry. Also the demand and supply situation varies greatly between countries. No clear cut trend or pattern can be identified when regarding manpower forecasts undertaken by national authorities and ILO experts in a wide range of countries.

(2) The experience of international contractors*

The activities of international contracting firms operating in various fields in developing countries would seem to offer substantial scope for training action and skill transfer from industrialised countries.

Because of the need to remain competitive and reduce their costs to a minimum, contractors endeavour to speed up operations. They are reluctant to use labour-intensive techniques, even on jobs on which such techniques are customary because using them generally prolongs the duration of operations.

---

1) See Naciones Unidas, Educación, recursos humanos y desarrollo en América Latina, New York, 1966, p. 48.52.

* These are conclusions from a survey conducted among international contracting firms by the ILO in 1966.

As a rule, international contractors try to manage with a minimum of foreigners on the building sites abroad, in order to reduce costs. Foreign supervisors are, however, brought in. In general, this is the lowest level at which staff to be employed as chief superintendents or superintendents, as senior members of the administrative staff, as site foremen and as supervisors of maintenance workshops. The administrative staff and site foremen normally have local assistants.

At lower levels, the best workers are recruited from the large pool of unskilled and semi-skilled workers on a hiring and firing basis, the main criteria being good health, discipline, trainability and adaptability. Preference is generally given to candidates who can prove that they have already worked for an international contractor. Only one in three of the workers recruited on probation is in fact retained. Formal tests on recruitment are given only to equipment operators - this is because of the high cost of construction equipment.

All firms stated that they never had particular difficulty in constituting a good workforce for their building sites. They were satisfied to enthusiastic about the over-all quality of the workforce in the developing countries and, in some cases, rated them higher than comparable European teams. They stated that recruitment problems were not insurmountable, even in countries with less abundant labour pools.

On the whole, the firms were not worried about skill shortages and were confident of being able to overcome them by their own training action or by using special methods of work. At the skilled worker level there were, however, shortages of carpenters, plumbers, electricians and maintenance

mechanics for construction equipment - a trade in which fully skilled men with experience is required. It was stated, however, that even these shortages could be overcome by such steps as using prefabricated components for multi-unit construction, breaking up jobs into components which can be taught through short induction training on site and giving highly specialised training to maintenance crews. These other steps could in fact be more satisfactory, producing faster results at less cost. They had been used with varying success in order to reduce training needs to an absolute minimum and contractors tended to prefer them to training action.

All firms stated that, wherever training was organised, it was not formal and systematic. No curricula or syllabi were available and theoretical instruction was not provided. It was generally left to the site foremen to organise short-term practical training on the site according to specific needs and in the light of their experience. The effectiveness of training would thus depend entirely on the ability of the site foreman or chargehand to impart skills and to manage his team. Men exercising this key function thereby tended to determine the rate of progress and the quality of work on construction sites. The firms saw no need to alter or rationalise this ad hoc system of training which ensured a good deal of flexibility and left initiative to the site foremen.

It was indicated that types of skill imparted along the above lines would depend on the nature of the project. The following critical areas were identified: drivers and operators of all types of construction equipment (bulldozers, scrapers, paving machines, excavating shovels, hoists and cranes, concrete mixers, trench diggers, road rollers), maintenance mechanics for such equipment, welders, scaffolders, shutterers and, to a lesser degree, plumbers and electricians. However, it was possible to train workers for all such jobs quite successfully by short-term arrangements. Short-term training

for most other building trades was organized according to specific needs. It appeared that the general quality of work did not suffer from this approach and, in some cases, spectacular results had been achieved by short-term training of illiterate workers.

The firms recognized that workers trained in this somewhat haphazard manner did not usually become fully qualified craftsmen. Frequently, they remained illiterate and were not able to read blueprints although they might be capable of doing a good job if they were given a model and received oral instruction. The firms stated, however, that after each project they left a pool of reasonably well trained building workers, thereby making some contribution to the solution of manpower training problems in the developing countries. They realized, nevertheless, that these workers would not always find other relevant jobs and that only a small percentage could generally be transferred to other building sites run by the same or by other firms either within the country or in neighbouring ones.

II. Organising training

(1) The nature of the problem

The general situation with regard to training of workers for the building trades in developing countries is paradoxical. Few countries report that any considerable shortages exist in the modern sector. Those which are considered as severe are limited to a few trades and specializations and a comparatively small number of workers. They could, judging from experience in the industrialized countries, be overcome in most cases by fairly simple training

arrangements, often of an ad hoc nature. On the other hand, there is widespread complaint of the quality to site of skills and knowledge of building trades personnel.

The first and basic question is therefore whether any training problem really exists. The answer to this question should definitely be affirmative. Much recent development in the building trades in the industrialised countries has been possible only because these countries had well developed training systems providing the industry with highly qualified and well trained workers, supervisors and technicians who could adapt themselves to new techniques, the use of new methods and materials and to new patterns of work organisation on the site.

In contrast training facilities are as yet little developed in the non-industrialised countries; most on the-job training is traditional in character and usually uncontrolled; recruitment often takes place at a low educational level. In consequence, few workers have the necessary basic qualifications in the modern or intermediate sector. For promotion to site foremen or to follow upgrading courses to attain technician level, and in the traditional sector to become really competent craftsmen.

The absence of clearly identified critical shortages may be explained by the wide measure of adaptability which characterises the construction industry, and the acceptance in developing countries of poor quality work by traditional methods in most building activities. Training can help to solve these problems but cannot solve them alone as they are formed by the combined influence of a large number of economic and social factors.

The situation is complicated by the fact that construction methods, materials and machines used in the industrial countries are not always well adapted to the needs and conditions of the developing ones. Moreover, in urban housing, the methods of construction and types of design still used are largely the same as those used traditionally in industrialised countries which are not always appropriate to the climatic and other conditions of most developing countries.

The basis for improvement and development will necessarily emerge from applied research in construction techniques adapted to conditions in the various developing countries.

(2) A strategy for developing training

Most developing countries have a considerable need for housing and other construction work. However, few of these countries have a steady and high volume of active demand for construction work. The low levels of remuneration in most developing countries particularly within the traditional and intermediate sectors and the social cost of large-scale unemployment and underemployment make extensive mechanisation undesirable. This means that much use will necessarily continue to be made of labour-intensive work methods. As labour-intensive work requires a nucleus group of polyvalent and well-trained supervisors and other technical staff who are rarely being produced by existing training arrangements, one of the prerequisites for the development of appropriate building activities in developing countries is therefore a reform in the organisation of training.

A point of departure in discussion of such reforms should be a clear distinction between needs and demand. Any observer of the conditions, quality and maintenance of housing and other buildings in developing countries will testify to the need for improved techniques, materials and methods. The

problem - the lack of high grade workmanship, knowledge and skill - runs all the way from design, the production of building materials to the finishing job of the painter and plasterer.

What would constitute in these circumstances an appropriate and effective strategy for the reform of training for site personnel for the building indust

In order to achieve improvement in the industry it will be necessary to establish, in the sectors in which the demand for construction work justifies it, a nucleus of skilled men who can take the lead. These sectors will be the modern and usually the intermediate sector. Other measures are needed in parallel to training, for instance in the building materials industry, in town planning and in the allocation of investment funds.

In the modern sector, the central need for training would appear to be at foreman, technician, graduate engineer and management levels. In most industrialising countries there are not enough people who can plan, develop and implement large-scale building projects. As a result, projects have to be entrusted to foreign contractors who usually organise work along the lines followed in their own countries. As speed of implementation is a crucial factor and as these contractors are accustomed to working with highly mechanised methods, the employment creation effects of the large-scale building projects they conduct tend to be less than what might have been socially and economically desirable. In addition, the training effect of the projects is small. Because the foreign contractor is concerned with organisation for a two to three-year job he has little or no interest in providing for the long-term training and for the systematic rotation of personnel to gain varied experience which the nationals of a developing country would need if they are to learn the techniques of large-scale contracting work.

(3) Training of building technicians and superintendents

In countries with considerable facilities for the training of building engineers and technicians and in which there is an overt demand for such personnel - a minority of economically rapidly developing countries - the solution to the problem, may simply consist of revision of the syllabi and methods of training used in the technical universities and technical schools.

The functions of building engineers and technicians in developing countries and their opportunities of further training on the job in large undertakings and on industrially-organised projects differ a great deal from those of their colleagues in industrialised countries. Their initial training at university or technical school must, therefore, also be different. First, it must be more active and project-oriented. Because of the absence of ready-made examples appropriate to the conditions of developing countries and the lack of adequate textbooks the technical staff of developing countries need to be more imaginative, less bound by examples from abroad. Their training must therefore emphasise the tackling of new problems with methods adapted to the special climatic, social and financial conditions in developing countries, the availability of building materials and other supplies, prevailing wage levels, the characteristics of other members of the construction labour force, etc. To some extent it is essential for their training to emphasise the hypothetically possible rather than - as is now unfortunately often the case - the techniques used abroad.

As these building engineers and technicians will exercise supervisory functions, it will be necessary for their training to include learning practical work on the building site or in a training

yard. They will need to learn to direct high quality work by a process of learning-by-doing, and to become familiar with the social rules and conditions under which building worker teams operate on a site.

All this must obviously form part of their initial training - which should cover a wider range of knowledge and skill than required by most building technicians in industrialised countries.

Moreover, programmes need to be organised in such a manner that the largest possible proportion of those trained as engineers and technicians remain in construction and are prepared to be out on the work site and do the jobs at hand. Experience would seem to show that this cannot be achieved with the academically oriented types of secondary school and university level course which are now current practice in technical education in most developing countries.

Such courses will need to include work on real projects, with emphasis on problem-solving. One solution as far as intermediate staff are concerned may be to organise their training along career system lines made up of a series of full-time or part-time shorter courses spread over a number of years. If trade and technical school students tend to drop out of training to take up jobs in construction before they have completed their courses, as had been observed in many countries, efforts will be necessary to bring at least a proportion of these drop-outs back to training, giving them further training and technical education until they reach desirable standards of technical knowledge and skill.

(4) Training of site foremen and other supervisors

In industrialised countries site supervisors and foremen are usually recruited from the ranks of skilled workers with broad

training and experience. This has been possible only to a very limited extent in developing countries because of the inadequate education and training so often received by workers. Instead technicians have frequently been appointed. It seems, however, that if improved and selective training is organised for craftsmen, the shortage of qualified supervisors can be reduced and many of the qualitative problems in the construction industry can be solved.

However, regardless of how well trained they are, craftsmen seldom have the competence needed for direct entry into a supervisory position. Further training courses are needed in which they can learn the functions of planning, costing, laying out and controlling work and, not least important, how to train apprentices and other workers on the job. Introducing a master craftsman level reached by further training and examination may be one way of achieving this. Again, a flexible approach is called for. Group release courses at specialised centres organised specifically for the construction industry or part-time upgrading courses at technical colleges or teacher/instructor training institutions may be among the alternatives for choice.

(5) Training of workers

It is evident that the current lack of interest in providing for adequate training of specialised workers and craftsmen which has been observed in the building industry of many developing countries, must be overcome. The public authorities concerned and the employers' and workers' organisations must join forces to review the ways in which workers enter the building trades at present and acquire their skills. They should carry out this review within the framework of the national training system as a whole and aim at

determining how existing arrangements for building trades workers may be improved and, in particular, how the necessary nucleus of highly skilled workers with growth potential may be created.

Experience would seem to show that this cannot be done by relying on the models of the industrialised countries. Again, in the case of specialised and skilled workers, training programmes and organisation need to be tailored to the requirements of each country. These differ as regards recruitment practices, educational standards, the quality of current on-the-job training, the stability of the workforce and in many other aspects. All these elements should together determine the pattern of desirable training and, for this reason, no generally applicable patterns can be proposed.

All adequate training of specialised and skilled workers consists of three separate elements: provision of an adequate educational basis; systematic instruction in efficient techniques of work; and supervised application of these techniques in real work situations.

In most developing countries the basic problem, still seldom tackled, would seem to be of how to find ways of grafting a training improvement system on to the existing rudimentary skill building process in the industry and, parallel to such action, to explore fully the possibilities of providing systematic job experience in modern building site operations. Where the employment situation is unstable, training opportunities should be offered for upgrading skills between jobs - for young people, as well as for adults. Craftsmen with above average skills should be selected, given special training to supplement their knowledge and skill and placed systematically in jobs in which they can give instruction to young and adult workers while doing work of a semi-supervisory character.

It is obvious that training along the lines indicated cannot be classified under any of the current organizations or systems of vocational training. Completely full time institutional training has proved expensive and wasteful in most developing countries. Narrowly conceived apprenticeship based on the models and trade structures of industrialised countries and following the same criteria has proved difficult to apply. In the building trades, as in many other industries, the developing countries must find their own ways of organising training to achieve the desired results of accelerated development and rapid industrialization.

The aims should be to establish an adequate structure of skilled workers in all essential trades and other occupations within the industry. The determination of training programmes and standards must be based on an analysis of the work involved in the occupation at present and as it is likely to evolve in the future. Wherever possible, such training development work should be closely related to technical improvement work carried out by a building methods research centre.

As the educational level of workers in the building trades is usually low even at craftsman levels, the syllabi used in training above a certain level for young people and adults should, as a rule, contain a substantial element of further education. In countries where a large proportion of building trades workers are recruited among illiterates or semi illiterates, upgrading programmes may even have to begin with work-oriented literacy courses to lay a foundation for continued further training and educational and occupational upgrading.

There can be no question of aiming at training all workers; and there is no need to do so. The first step in a reorganisation

of current training [illegible] to seek out those who have growth potential and offer them the further education and training they need to rise above existing standards in their trade. It will be necessary for the facilities offered to be flexible and the courses so organised that the potential candidates can spare the time and afford the expense involved.

Many building workers in the intermediate and modern sectors work for only part of the year. Some have both the time and the will to take further education and training if the courses are organised in such a way that they do not lose their work opportunities. Most apprentices in the intermediate and traditional sectors work for only a part of the year, being idle during rainy seasons and periods of slackening demand. It is essential to exploit such opportunities for further education and training in improved techniques.

Observations in developing countries would suggest that, in most cases, training of young workers - to craftsmen and master craftsman levels, and to the level of supervisor - is best organised in the form of a modernised apprenticeship system combining training in employment with intensive short-term courses on a group release basis during slack periods.

(6) Special arrangements for the intermediate sector

Experience in developing countries would seem to show that employers in the intermediate sector are those who need the largest measure of encouragement to train to high standards. They are usually, at the same time, little equipped to undertake comprehensive training for this purpose. As this is a key sector for skill

improvement and [illegible] to be taken to encourage [illegible] to play their full part in the overall training job of the industry. Such measures may include the [illegible] mobile instruction units and [illegible] practical and theoretical [illegible] initial and further training of [illegible] to the industry and for the upgrading and updating of skills for those who have already achieved a certain level of skill.

(7) The traditional sector and special self-help schemes

There are considerable needs for improvement of building work in the subsistence and marginal sectors of the economy and which cannot be expected to turn into demands for commercially organised construction work before the per capita income in these social groups has grown to much higher levels. But this cannot be expected to happen for a long time. In view of these, and for improving employment prospects and lowering the level of underemployment in these groups of the population, large scale training measures are desirable.

There can be no question of training workers to the same standard of skill as those required for the industrialisation of commercial building activities. Programmes of training will have to be designed with a view to touching the specific skills and knowledge required at the village and community levels for improvement of housing, slum eradication and the infrastructure of buildings, roads, irrigation and sanitation systems.

The craftsmen belonging to the traditional sector are, as a rule, of low education and have had their training exclusively on the job;

the volume of their work finally and also the type of construction work done by them is on the whole different from that done by undertakings in the intermediate and modern sectors.

Their training needs are difficult to tackle because so little is known about what might usefully be taught to them, because they need both general education and technical/practical upgrading and because many of them live in villages and small towns far from the areas in which any permanent facilities for vocational training exist. Yet upgrading these craftsmen would appear to be a key task for improving construction work in rural and smaller urban areas. Their poverty generally precludes using the type of training arrangements which may help to improve the work of entrepreneurs and craftsmen in the intermediate sector.

The principle means of training craftsmen in the traditional sector could be an extensive use of different types of mass communication media and decentralised and itinerant courses of various kinds. Support may be given by radio programmes teaching techniques of improving local materials for use in construction. Techniques which require personal instruction, such as house wiring, repair and maintenance of mechanical and electrical equipment, may be taught by mobile courses and itinerant instructors as the need arises, for instance when opportunities for electrification are extended to new areas.

Gradually the system of apprenticeship which can be highly structured in the traditional sector may be reformed and improved by arranging special complementary courses in community development centres, rural training centres and other educational and training facilities existing in rural areas. Craftsmen who have proved more

proficient than others may be given special consideration for training apprenticeship, and vice versa. The craftsman may be granted certificates of levels of skill and trade knowledge proved by means of trade tests and examinations specially designed for the purpose. By upgrading these and other means in the traditional sector, an increasing number of traditionally-trained craftsmen may gradually learn to carry out more demanding jobs and many of them may in fact move into the intermediate sector of small entrepreneurs and skilled workers who are able to do jobs up to acceptable commercial standard.

Parallel to improving the training of craftsmen in rural areas and smaller towns a larger group of the population needs to be made aware of improved standards of construction and also be taught the skills needed for self-help construction work.

A problem common to many of these activities which can take a wide variety of forms is that the authorities concerned are not always properly equipped with the technical staff required for designing the projects, determining proper standards for materials and layout and for supervising the field work in the towns and villages and by the groups of people concerned. It is not always realised that the organisation of such schemes and the teaching of self-help building methods require comprehensive background work of the same character as any other large-scale building project.

In other words, such schemes need to be organised along industrial lines. Expressed in management terms, they require for successful implementation a carefully worked out organisation including offices for design, planning, materials testing, planning the programming of training, instructor and supervisor training and field supervision by technically competent staff. This places special demands

on the capacity of [illegible] which are similar to, but not identical with those deriving from the modern sector and on research and development work for the building industry.

(8) Organisation and administration of training

The over all planning and organisation of vocational training and technical/vocational education must be accepted as the responsibility of the government authorities concerned with the utilisation and development of the human resources of each country. The principal responsibility for the large-scale diffusion of skill and knowledge which takes place within the special schemes with a training component must also be assumed by the public authorities: those concerned with vocational training in urban and rural areas, with youth employment, community development and with social and infrastructural improvement.

At the level of over-all planning and organisation of vocational training and technical/vocational education, it is essential that employers and workers representing the principal branches of the economy should participate in the decision-making process. In view of the importance of the construction industry as an employer of manpower and a contributor to economic development, it is highly desirable that the industry be well represented in this process in the decision-making bodies.

The principal role of the industry is, however, at the stage of training scheme implementation. As no training is complete without practical instruction and experience on the job, building

employers and workers will need to organise themselves to make the best possible contribution to the training process.

It is essential for the undertakings to provide an administrative framework for their own training. Larger undertakings in developing countries have generally recognised that it is necessary to provide for a specialised officer or section in their organisation to plan and develop their training action. A number of trade associations, chambers of industry and other professional bodies employ training consultants and provide for the training action which the individual undertakings cannot handle. An increasing number of governments provide similar advisory services to the construction industry.

It would not seem possible to suggest an administrative structure which would apply in all circumstances. In many countries a Ministry of Education, Ministry of Labour or a Ministry of Planning may be the body best suited for determining the general lines along which the systems of technical and vocational education and training for all fields of economic activity should be developed, standards set and training institutions established. In the Latin American context, it has been considered desirable to delegate principal authority in these fields to a national training body. In other countries - but in few developing ones - major responsibility for training and manpower development has been delegated to industrial training boards, one for each industry. The choice of pattern to be applied must be determined in the light of the administrative practices, traditions and needs of each country.

(9) Incentives to train and to be trained

Much training is substandard or no training at all is given because the employer or worker concerned does not have any real incentive to train or to be trained. The construction industry has its own disincentives in the seasonal and cyclical nature of its activities. It is of great importance for the development of an adequate training system that these problems be overcome.

Again, there is no generally applicable answer to the question as to how this can be done. In some countries the operation of levy/grant systems may be a desirable approach to providing incentives for an industry to increase the volume of its training and to providing the necessary means for an appropriate training administration to function properly. As previously indicated, levy/grant systems are often difficult to operate, however, when an industry consists of many small and geographically dispersed units - as is often the case in construction. It may also not be desirable to place new tax burdens on an industry which, in most developing countries, is short of working capital.

Some countries have made it compulsory for foreign contractors and equipment manufacturers to train nationals during the period they are operating in the country concerned. Action of this kind may be desirable in many cases in order to reap full benefit from the presence of foreign expertise in the country. The foreign contractor will naturally include the cost of such training in his bill. It is for this reason important to explore the extent to which such measures are likely to provide efficient training at lowest cost, and to include such clauses in the contracts covering building projects only when other training arrangements would not produce the same or better results at lower cost.

III. International action

A. Technical cooperation in the training field with particular emphasis on ILO activities

It has been emphasized above that improving training for building activities - whatever the economic sector or social level - is essentially a problem which has to be solved at a national level and, in larger countries often even at a regional level, as conditions and traditions differ widely between developing countries and frequently also within individual ones. But this does not preclude the international community from playing an important role in such action.

Institutions working at an international level - in multi-lateral or bilateral inter-governmental cooperation and in privately organised assistance and exchange schemes - have already made a substantial contribution to the training of skilled personnel for construction work in developing countries.

In view of its particular responsibilities in the vocational training field and since the beginning of technical cooperation, the ILO has assisted in the establishment of national training institutions and special training schemes directly geared to the construction sector in developing countries. Such activities covered the range from managerial, instructor, site foreman and skilled worker training with emphasis on masonry, concrete work, carpentry, plumbing and pipe-fitting, welding, sheetmetal work, electrical installations and construction machinery maintenance. Training of training managers, building trades instructors and site foremen received priority considering the multiplier effect of such training.

At present the ILO runs 25 technical cooperation projects in vocational training in the same number of developing countries with a substantial building trades component and one project exclusively dealing with the construction sector. There are 58 building trades experts in service. Moreover, the productivity centres set up with the assistance of the ILO in numerous countries have a direct impact on raising the standards of management and productivity in the construction sector by organising seminars in project planning and control, site planning and management, design analysis and costing.

The International Centre for Advanced Technical and Vocational Training in Turin established by the ILO, also contributes its share to improving the conditions of the construction industry in developing countries by training instructors, training managers and supervisory personnel in the application of modern training techniques. The Centre has also organised special courses in construction technology such as modern woodworking techniques for the updating of technicians.

One of the principal objectives of ILO action is to bring about rationalisation of training activities. To this effect an effort is being made to continuously improve training methods and approaches. Therefore the ILO has embarked on a programme of development of a system of modular training applicable to conditions in developing countries. Its essential feature is the design of modules of employable skills which may be taught singly or in combination. The purpose is to overcome the traditional craft training approach which had only limited success and to make training more employment directed.

In this context the work of the International Research and Documentation Centre on Vocational Training (CINTERFOR), set up and administered by the ILO, deserves particular mention. The Centre coordinates effectively the research and development functions of the existing national training institutions in Latin America. One of its central tasks is the preparation of instructional materials, the so-called CINTERFOR Basic Collections - CBC. The Centre has now started to work out series for the training in building trades in collaboration with various national institutions. This standardisation and pooling of resources constitutes a considerable saving in time and money and is meeting with great success in the region and beyond.

The above efforts in human resources development in the construction sector are dovetailed with the World Employment Programme launched by the ILO in 1969 as its major contribution to the Second Development Decade. It aims at evolving dynamic employment policies in its member states in order to increase job opportunities for the millions of unemployed and underemployed people in the developing world. It is evident that the construction sector, in particular labour intensive public works, has considerable potential of absorbing many of these jobless people. One of the conditions is, of course, that an adequate skill mix is created in the sector through management and vocational training to make such policies fully effective.

In the training field help has also been rendered by the internationally operating contracting firms and the equipment manufacturers who, to some extent, have exported equipment and equipment handling skills together. As experience has grown,

it has been realised increasingly by all those aspects of training that an indiscriminate transfer of patterns followed in industrialised countries [illegible] a short view action likely, in some cases at least, to do more harm than good in the long run.

The general trend is towards increased emphasis on tailor-made programmes of research, development and training designed in the light of the special requirements of the country or region concerned.

This trend is apparent not only in action taken in developing countries themselves, but also in the organisation of training abroad for students and technical staff receiving grants and fellowships for this purpose. This trend needs to be further developed and reinforced. One line of action, which is evident as a trend in requests for technical cooperation made by the authorities in developing countries, is to provide for comprehensive and coherent long term planning of the systems of technical education and vocational training with a view to the most efficient use of all facilities which can be made available, including opportunities for systematic training on the job.

Once the over-all system of training has been planned, many governments have submitted requests, in the past few years, for assistance with the reorganisation of technical education and vocational training with a view to sectoral improvement. So far, most of these requests relate to branches of economic activity other than the building industry. There is reason to believe, however, that with growing experience of sectoral projects future requests will include ones which aim at improving the

standards of knowledge and skill in the building industry.

It would seem desirable that building research institutions, technical universities and a number of training institutions should develop programmes of study and training specifically designed to assist in solving the particular problems to be faced in improving the levels of achievement in construction work in developing countries. Such programmes of study and training are needed not only to enable the developing countries to help themselves, but also to supply competent staff for contracting firms undertaking work in the developing countries.

One of the prerequisites for improved technical education and training is an expansion of research, materials development and testing and methods improvement, inter alia, with a view to the design of economically sound labour-intensive methods of work for countries with high rates of unemployment and underemployment. This is a field in which action at both a national and an international level is required. The trend towards the creation of specialised national building research institutes should therefore be encouraged by arrangements for exchange of information at the international level.

However, only a few larger developing countries may have the means of setting up such institutions within the foreseeable future. For this reason and also for reasons of economy of effort, it would seem desirable both to promote the establishment of arrangements for cooperative efforts in this field between groups of countries, perhaps on a regional basis, and to arrange for standing agreements for research and training action in existing institutions to cater also for some of the needs of countries

which do not have a [illegible] scope of work for the setting up of institutes or [illegible] to be undertaken.

Research and development [illegible] are also needed particularly urgently for mass skill diffusion action relating to the traditional and marginal sectors and the various special schemes. This has been shown by the fact that many schemes have failed to attain the targets set or have proved to be unduly expensive in relation to the results achieved and the training impact made. The magnitude of the task ahead, the large numbers of people involved, the rapid growth in the size of the youth generations for whose employment needs such schemes are essentially designed - all these factors make it imperative to develop appropriate standards, programmes and methods of organising them and of evaluating the results. Few, if any, of the developing countries are in a position to do all this work alone.

In this and all other fields relating to the improvement of work in construction in developing countries there is a need for further amplification of both national and international action. Close cooperation is required between international and national bodies in project development, and supporting research and training action by academic institutions specialising in management development and advanced technical training. The establishment of new training programmes and the improvement of existing ones should be inspired by research into building methods and materials carried on by specialised national and international bodies, such as the United Nations Centre for Housing, Building and Planning. All these activities should be welded into a concerted effort to help solve some of the most central problems of developing countries today: to accelerate the improvement of their standards of living

and to provide employment for young people who would without jobs.

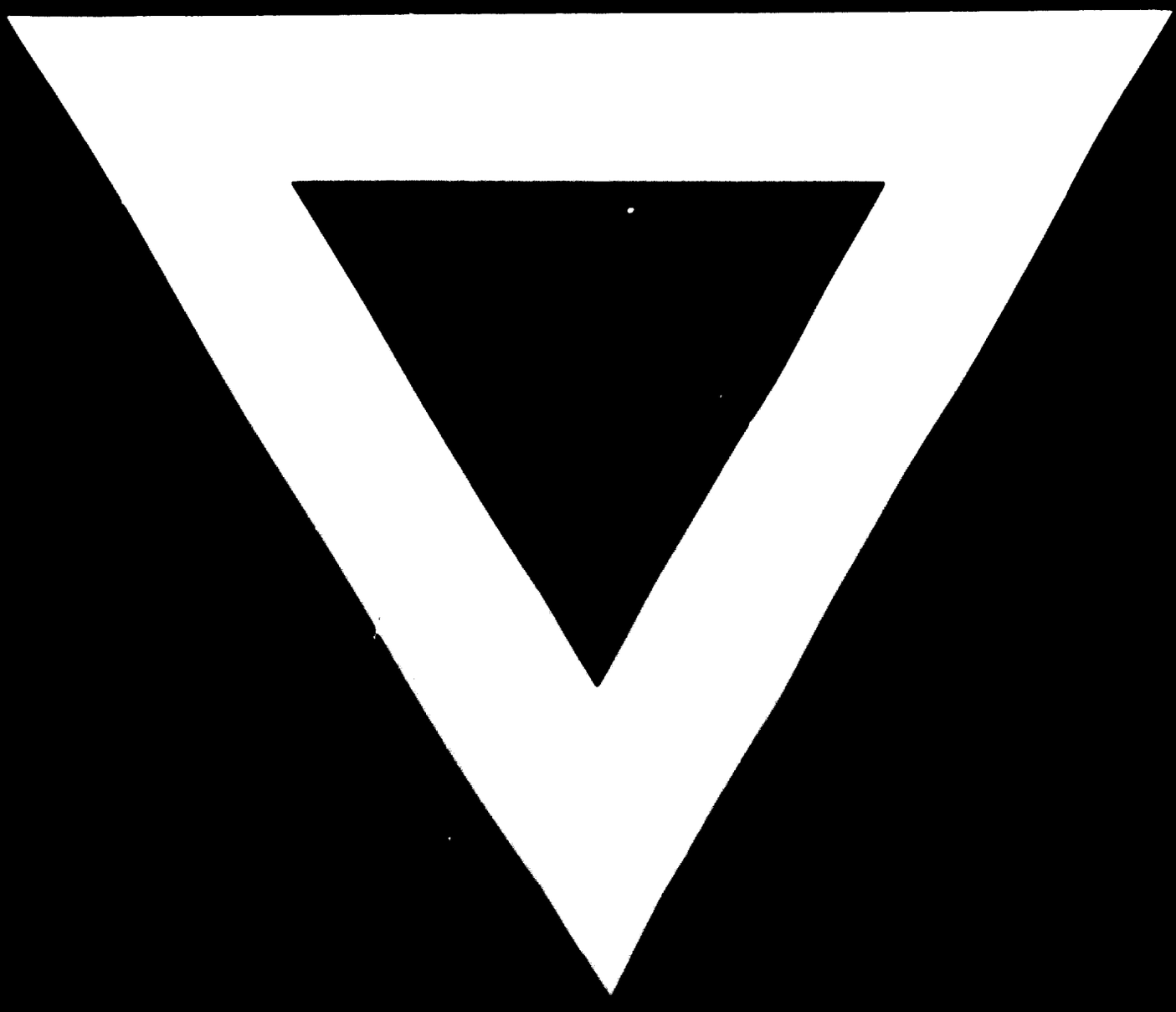
B. Standard-setting

The argument mentioned in paragraph 1 above is that training of staff is only a partial aspect of the improvement of conditions in the construction sector. Training must be imbedded in a host of other measures designed to further construction workers' standard of living and their efficiency. One of the main tasks of the ILO in this respect is to set international standards. It is guided in this work by the Building, Civil Engineering and Public Works Committee on which governments, employers' and workers' organizations are represented. The deliberations and conclusions of this Committee highlight the social and training problems in the industry. In its session in July 1971 the Committee formulated practical guidance for the tackling of a whole range of labour problems including measures to be taken in the training of architects, civil engineers, draughtsmen, contractors, site foremen and skilled construction workers in developing countries. Such guidance enables the ILO to remain in close contact with the social situation in the construction sector and to design its projects in a realistic way with appropriate objectives.

The general principles by which all ILO technical cooperation work in vocational training including training in the construction sector is guided are contained in the Vocational Training Recommendation, 1962, adopted by the International Labour Conference This recommendation is dovetailed with UNESCO Recommendation concerning technical and vocational education of 1962 which applies

to institutional education. Both recommendations have contributed to national policy formulation and the launching of important education and training programs in numerous countries. Particularly the provisions concerning apprenticeship and adult training in the ILO recommendation have had an impact on the construction sector by stimulating national regulations in these fields.

It should be noted that technical and social changes have made a revision of both international instruments necessary which will be undertaken in the next two years. This is proof of the dynamic development in the field of education and training from which the construction sector is bound to benefit.



74.09.13