



**UNITED NATIONS
ECONOMIC AND SOCIAL COUNCIL**

✓ 61073014X



**Distr.
GENERAL
E/ECA/HUS/58
November 1991
Original: ENGLISH**

**UNITED NATIONS
ECONOMIC COMMISSION FOR AFRICA
Industry and Human Settlements Division**

**MANUAL FOR THE TRAINING OF
SMALL-SCALE TECHNICIANS AND ARTISANS FOR THE
DEVELOPMENT OF AN INDIGENOUS CONSTRUCTION SECTOR**

TABLE OF CONTENTS

I. INTRODUCTION	1
II. TRAINING OF TECHNICIANS AND ARTISANS IN AFRICAN COUNTRIES	2
III. DEFICIENCIES OF CURRENT EFFORTS	3
IV. STRATEGIES FOR DEALING WITH TRAINING NEEDS	5
V. PROPOSALS FOR TRAINING PROGRAMME FOR TECHNICIANS	7
VI. PROPOSALS FOR A TRAINING PROGRAMME FOR ARTISANS	13
VII. RECOMMENDATIONS TO AFRICAN COUNTRIES	15
BIBLIOGRAPHY	18

I. INTRODUCTION

1. Labour constitutes the second largest single component of resources required by the construction industry, after building materials. In most African countries, the importance of construction labour to the national economy can be measured in terms of generating employment. The construction sector accounts for between 2 and 6 per cent of the total labour force, excluding the contributions of the informal and traditional sectors which are not accounted for in most official statistics.

2. Construction activity is predominantly a labour-intensive industry, particularly in the African countries. As such, it tends to attract a large proportion of unskilled labour, including temporary and seasonal labour, and through apprenticeship training and other informal training procedures, contributes to development by acting as a skill processor.

3. Manpower resources are abundant in most African countries, but, skilled and professional labour in the construction sector is scarce and expensive - so much so that some countries are dependent on imported labour. In addition, there is a problem of low productivity in the construction industry. One of the causes of the two basic difficulties mentioned above - i.e., lack of skilled labour and low productivity of available labour - is the inadequate scale and scope of training* provided to manpower in the construction industry. Existing conventional training institutions do not have the capacity to train the required number of skilled and professional workers, and their training programmes are not comprehensive enough for the range of activities that take place in the construction industry. Furthermore, the overall approach to training programmes is usually inappropriate for the requirements of the indigenous construction sector.

4. In contrast to conventional training institutions, there exist a traditional training system, based on apprenticeship, which is very common in the informal construction sector. Despite its potential benefits, the system has not been developed.

5. There is a pressing need in Africa for training of small-scale technicians and artisans for the development of an indigenous construction sector. In many countries throughout the continent the domestic construction sector has remained relatively weak over years. As a result a pattern has been established in which there

*/ Training has commonly been viewed as a method for bringing persons to a prescribed level of efficiency in particular tasks by imparting skills through instruction and/or practice. Whereas education is presumed to arm a person with basic knowledge, training aims to adapt that knowledge to the world of work.

are often deep and extensive incursions into the contracting market by large companies of expatriate origin and by firms relying heavily on foreign expertise. Meanwhile, little or nothing has been done to foster the growth of vigorous and efficient domestic capabilities.

6. The United Nations Economic Commission for Africa would undertake a broad range of activities aimed at facilitating the development of domestic construction industries in the continent within the framework of the second IDDA. Those activities would include the implementation of training of small-scale technicians and artisans for the development of an indigenous construction sector. This Manual has been prepared as part of the ECA's contribution to the above mentioned Decade and it aims at greater self-reliance in construction at the national level. The main concern of the Manual is to offer advice on how a successful training programmes for technicians and artisans can be prepared and run.

II. TRAINING OF TECHNICIANS AND ARTISANS IN AFRICAN COUNTRIES

7. The largest proportion of training of technicians for the development of an indigenous construction sector in African countries takes place locally through administrative staff colleges, institutes of management and schools of architecture, planning and engineering. In addition to operating regular professional and graduate courses, many of those training centres run short and medium-length courses for specific groups, to prepare them to perform particular tasks. The importance of those institutions can be expected to increase over the coming decade, and they should eventually absorb many of the current training activities in African countries directed at their situations.

8. Within the region, facilities, materials and trainers were inadequate to meet local requirements. Population growth and urbanization were proceeding at such a pace that the dearth of trained personnel was placing severe restrictions on the capabilities of Governments to cope with construction sector problems. There are valuable training programmes in a few institutions but they are sparsely scattered over the region. Text books and training materials were imported from the industrialized countries and were, by and large, unsuitable to the conditions of Africa.

9. Most grass-roots-level workers had no training. There is no permanent cadre of construction sector personnel, and there is little utilization of training as a means of upgrading skills or re-orienting personnel attitudes and perceptions.

10. Africa probably faced the most severe shortage of training facilities of any developing region. In a survey of training needs for the development and management of urban settlements for

countries in the eastern and southern subregion of Africa, it was found that Governments lacked the ability even to assess training needs, maintain records of skills of various personnel, and assign trainees to appropriate training programmes. There was a particular need for basic technical skills in project design, implementation and maintenance, but inability to offer short term courses for key personnel within the region was a constraint to the development of domestic construction sector. Although the countries of Africa recognized the need to enter into joint training programmes, their financial situation required low-cost approaches specially adapted to their needs.

III. DEFICIENCIES OF CURRENT EFFORTS

11. Shortcomings in the field of training are summarized below:

- National manpower planning has generally ignored the need to build skills and awareness. Little attention is paid to upgrading the skills of those who are actually performing the work because it is not generally recognized that even those who have received university degrees need to be specially trained to fulfil specific developmental tasks and must have their skills improved through periodic retraining. Manpower planning in indigenous construction sector is not a task of simply fitting a prescribed number of degree holders into a given series of slots. It is, rather, a continuous effort to determine the basic skills, knowledge and motivation necessary to make the system function, and to decide how that can be done in the simplest and least expensive manner.

- The educational background and other socio-economic characteristics of the bulk of the labour force engaged in the construction industry in most African countries are such that conventional educational methods, involving school attendance, lectures and the acquisition of certificates are not appropriate. Practical training systems are required, and policy in that regard should consider on-the-job aspects because of the lack of contact with the industry itself.

- The apprenticeship training system, which is very common in the informal construction sector and contributes to training skilled artisans for the formal construction sector, is not concentrated on the contents of training given by the master artisans, such as improved construction techniques, production methods and site organization.

- Despite its potential benefits, the system for training technicians and artisans involved in the production of indigenous building materials has not been developed. These technicians and artisans should be fully conversant with the technology of

production and use of such building materials, quality control procedures and marketing.

- Assessments of training requirements are inadequate. Assessment of training needs has traditionally been an evaluation of the capabilities of local training and research institutions rather than an assessment of the training needs of specific areas of construction sector. The focus of concern has been on establishing training institutions, assuming that they will, in turn, determine needs. The process of determining needs, however, has rarely followed. Simple methods and procedures for assessing training requirements have not been designed and tested.

- Local authorities have been neglected. Local agencies bear the primary responsibility for providing basic growth and socio-economic transformation, and translating policy into practice. Yet, with respect to personnel planning and training those agencies are neglected. By and large, local agencies depend on large numbers of untrained personnel directed by a few graduates of formal courses in traditional disciplines who are untrained in the management of construction efforts.

- Regional co-operation is lacking. Because of the scarcity of national financial resources, many countries are unable to build and support an entire training system focused on the requirements of local authorities and development agencies. Lacking the ability to provide adequate facilities themselves and facing inadequate regional and subregional collaboration, many African countries are unable to offer suitable training. Training institutes that can act in the capacity of regional centres of excellence and that can service national training agencies are lacking. Such centres are necessary in order to carry out training assessments, train national trainers, prepare locally based training materials, sponsor training symposia for special groups and establish networking systems between local institutes, international agencies and regional centres.

- International co-ordination is lacking. International agencies do not adequately co-ordinate their efforts in training. Their support does not fit into a pattern based on studies of requirements and capabilities, or on a determination of how programmes of assistance can complement one another. Some local training activities receive an excessive amount of attention from competing donor agencies, with others, equally worthy, languish without sufficient support.

IV. STRATEGIES FOR DEALING WITH TRAINING NEEDS

12. It is necessary to undertake country-specific and region-wide analyses of training needs in order to establish magnitudes and

priorities of demand and to determine how training requirements might be met. The evaluation of needs must concern itself primarily with analysis of the skill requirements of those who will actually do the jobs, and that important task must proceed on a much larger scale than in the past and must encompass a far greater number of groups. Current assessment systems are too limited in scope and fail to portray the true magnitude and diversity of the problem that confronts African countries. It is necessary to determine, concurrent with assessing training needs, how local training institutes can be upgraded and/or can have their programmes expanded to satisfy these needs. In practical terms, that means evolving new ways to increase greatly the output of trained technicians and artisans from established training centres. Many such training centres now have no construction sector courses at all, so that much fundamental work is required to introduce the necessary capacity.

13. A shift in training capacities from the developed countries to African countries must be realized. That can only be achieved if resources are directed to supporting national efforts and developing regional support capabilities. Programmes should be promoted to link the training experience and resources of the industrialized world with the activities of local training centres in a manner which, over time, will shift resources and capabilities to African region. The approach involves the exchange of trainers, the exchange of learning materials and the exchange of experience through various networking mechanisms.

14. A special task inherent in the improvement of training institutions and activities in African countries is the training of those who do the training. Training requires special skills and talents that are not common, and competent persons with a good deal of practical experience are required. It is often difficult, however, to attract such persons to the job of training and to reward them sufficiently to keep them on the job and improve their performance. Since there are no generally established ways to enter the field of construction sector training, special attention has to be directed to the recruitment, training and career advancement of trainers. Local training courses assisted by multilateral and bilateral aid agencies are increasingly incorporating substantial numbers of trainers as regular participants in courses designed for practitioners. This is an excellent device for improving the skills of trainers and should form a component of externally added training activities.

15. A key requirement is to improve the functioning of local authorities in African countries through comprehensive training programmes. Unfortunately, local authorities in most African countries do not perform well. Rather than act as key agents in the provision of basic services and facilities, they act as impediments. Yet the performances of their prescribed role is

necessary if construction sector is to function. If limited training resources are directed to local authorities, highly effective results can be achieved in the management of basic services, in the introduction of participatory method and in the sharing of construction sector policies responsive to reality.

16. A high-priority requirement is to strengthen the management and training capabilities of selected training centres in African countries. Such centres should play a role in the training of trainers, develop training modules, publish relevant methods, manuals and materials, and promote networking between supporting international agencies, regional centres and national training agencies. They should also maintain data banks related to individuals, agencies, manuals, materials, training modules and other relevant resources for training requirements.

17. Another key requirement is to shift the focus of aid organizations from executing training programmes to supporting Governments and local training institutes in the satisfaction of their own training requirements. In their new role, donor agencies should take the lead in promoting the analysis of national, agency and programme needs, and in assessing training capabilities to meet those requirements. They should emphasize pilot courses in subject areas which require innovation and from which new learning methods can be expected to emerge. They should help selected training centres to enhance their methods and to improve the capabilities of their trainers. They should provide backup assistance to training centres by creating, publishing and distributing appropriate learning materials. That approach would reduce the burden of actual training on the international community and shift training to efficient and effective local venues.

18. The creation of regional information networks will provide a means of communication with a large training clientele. Costly materials, such as course designs, manuals and audio-visual presentations, which are often prepared for a single training event or for the use of a single training agency, can be shared, and information on new learning processes, procedures and methods can be exchanged. Networks can link region, nations and local areas into professional communities of trainers focused on the problems of construction industry, and newsletters, journals, workshops and symposia can all give a meaningful structure to those important networks.

19. Through national workshops and regional seminars, policy makers must be made aware of the special value of training. The role of training as an element of human-resource development can be advanced through such meetings, and the benefits of national manpower plans with an integral training component can be emphasized. Although staff training does not guarantee successful operation at any level of government, it is one condition of

success, because, unless those involved in the tasks of providing essential services and facilities to construction sector are capable of doing the job, other elements of construction sector management, such as administration and financing, cannot achieve results.

V. PROPOSALS FOR TRAINING PROGRAMME FOR TECHNICIANS

20. Government officials concerned with construction will need in-service training as well as contractors and their personnel. The focus of this training should, in the first instance, be on government personnel responsible for project design and specifications, contracting procedures and contract administration and be designed to acquaint them with the objectives and elements of the proposed contractor development programme. Following this, training should be directed towards the concepts of value engineering and the criteria and standards that should be applied in the supervision and acceptance of construction work. Furthermore, those government staff particularly concerned with designing and specification writing should be made familiar with the capabilities of contractors and the resources of the local industry as a whole. In addition to this specially devised training, construction officials should be enabled to obtain a better appreciation of the contractor's problems by 'sitting in' from time to time, on organized training courses for contractors and by accompanying the personnel assigned to advise contractors in the field.

21. It is undoubtedly vital that all government personnel concerned with project design and supervision should be given, through in-service training, a better appreciation of the contractor's problems and requirements. In many respects the development of a domestic construction industry depends on the development of a better understanding and knowledge on the part of the employer of the contractor's problems.

22. The contractor training and his personnel could be made available in two ways: primarily through informal training or operational 'on-the-job' advice, but through complementary formal training given in a 'classroom' situation. Both types of training should cover a variety of subjects in a manner relevant to the proper management of the development of a contracting enterprise. There is a wide range of topics which are relevant for contractor training. Some of the most common areas where effective training can lead to dramatic improvements in performance are listed in Table 1.

Table 1 : Topics for contractor training

Area	Topic
Technical	Estimating Materials management Planning and programming Plant management Site organization Tendering
Managerial	Company organization Long-term planning Personnel management
Financial	Bookkeeping Budgeting Cash flow analysis Cost control Purchasing

23. The division of topics under technical, managerial and financial headings is inevitably somewhat arbitrary, since the effective contractor finds that most tasks call upon a mix of technical, managerial and financial skills. The listing is by no means exclusive, and it is the trainer's task to assess local needs and local demand. Various mixes of topics may also be chosen according target group. For instance, some of the topics may be suitable for owners and others for their staff, depending on the size of the firm. In small companies the owner will perform most of the functions mentioned above, whereas in bigger ones the functions will be divided.

24. International Labour Office (Geneva) has produced Interactive Contractor Training (ICT) packages. These have been specifically prepared, tested and modified for use in training contractors in developing countries. The broad target group are managers and owner-managers of small-and medium-scale construction enterprises, although much of the material could be adapted to train middle-level and junior managers in larger firms. The material is presented in a flexible modular format, so that it can be easily adapted to suit local conditions. The ILO offers some advice on adapting the ICT modules, and this advice should be of general interest to trainers who are faced with adapting training material of various kinds to local circumstances.

25. Each module in the ICT series is devoted to a particular area of construction management which is relevant to the needs of contractors in developing countries. The first three modules are as follows:

- Estimating and tendering.
- Project planning.
- Site productivity.
- Further modules are in preparation, and the second set will cover:
 - Contract finance.
 - Contract procedures.
 - Business finance.

26. Each module is divided into learning elements. For example, this is the content of the module on project planning:

ELEMENT 1	INTRODUCTION
ELEMENT 2	WHAT IS PLANNING?
ELEMENT 3	WHY PLAN?
ELEMENT 4	PREPARING A BAR CHART
ELEMENT 5	SHORT-TERM PROGRAMME
ELEMENT 6	MATERIALS SCHEDULES
ELEMENT 7	RECORDING PROGRESS
ELEMENT 8	WHEN THE WORK DOES NOT GO AS PLANNED
ELEMENT 9	CASH FLOW ANALYSIS
ELEMENT 10	NETWORK ANALYSIS
ELEMENT 11	PUTTING THE PLAN INTO ACTION
	SIMULATION

27. Each element of this module deals with a different aspect of planning and contains the necessary learning material and exercises. This means that the elements can be run independently, which offers considerable flexibility to the trainer when compiling a syllabus. Other modules in the series are built up in a similar way. Hence a syllabus can be built up of elements from various modules in order to suit the exact training need of the participants.

28. The elements are divided into different parts as follows:

- learning text;
- worked example;
- exercises;
- quiz;
- simulation.

29. An element may contain any combination of these parts. Few elements in fact contain all of them. The parts all have different functions in the building of a skill. They are based on the assumption that to develop a managerial skill in a group of contract, the following successive steps are necessary:

- learning the technique;
- learning how the technique is generally applied;
- learning how to apply it to solve their own problems.

30. It is important that trainers should regard the module not as a finished product but as a starting point for the preparation of the material to be used on the courses for which they are responsible.

31. Informal training and individual advice can : (1) concentrate on the practical problems and deficiencies of the contractor; (2) take and guide him through all of the successive steps of the construction process; and (3) produce the practical experience, case material and knowledge of critical problems which will help to determine the content and focus of organized formal training courses. The training staff should, however, be aware of the difficulties of providing informal training on the site and in the office. The working environment is not ideal for absorbing information and advice other than on very specific problems and points of detail. It does not provide favourable opportunities for systematic training in any one subject. There is also a danger that the adviser on the site may in essence become simply a building inspector rested only in ensuring that the contractor works in accordance with specifications. However, the adviser can play a useful role in guiding the contractor and his staff on each successive step in the whole sequence of operations involved in carrying out a single contract. Thus, for each contract the adviser can prepare a checklist on the timing, nature and methods involved in each sequential step of the construction process. After each visit to the work site and observation of the work in hand, the adviser and contractor (or his superintendent) can then discuss, on the basis of the checklist, the progress of the work and the necessary action that needs to be taken to remedy any differences which have been observed. Appropriate notations on the checklist will provide a useful record of the progress of the contractor and his responsiveness to advice.

32. Formal group training is important not only because it is more economical for training personnel, but also because certain subjects lend themselves more readily to systematic exposition than to ad hoc advice. Organized training should focus primarily on problems relating to construction management, including contract terms and procedures, methods of estimating and tendering, cost control systems and budgeting, job programming and labour and materials scheduling and record keeping, particularly accounting.

At a more advanced stage, such training could be broadened to include marketing, insurance, plant management, measurement and invoicing of completed work, borrowing money and banking practices, work study, personnel management and training, and site safety and welfare. Certain technical subjects can also be covered by organized training. Training courses should be designed to promote a proper understanding and interpretation of specifications and drawings and to explore specific technical subjects, such as methods for producing and using concrete, roofing problems involving the use of different materials and methods, road construction techniques, etc. The 'classroom' work in such courses, which would have to rely heavily on technical illustrations, would in most cases be usefully supplemented by visits to construction sites.

33. In general, the subject matter of training courses must be determined in light of the current needs of the contractor and the constraints governing the number, location, length, and timing of such courses. Their, detailed content can be prescribed only in the context of a particular country, taking into account the type and level of contractors to be trained and their special needs. When considering the structure of formal training courses, the training staff should : (1) limit their duration to not more than a week, so that contractors and their personnel will not be deterred from attending; (2) group participants as far as possible by level of their prior education and experience so that their capacity to learn will be more or less uniform; (3) proceed as soon as possible from general courses to more specialized courses; (4) structure the course content to practical problems identified by experience in advising and observing contractors in the field; (5) encourage 'learning' as far as possible through discussion of case material and actual examples rather than by lecturing; and (6) make sure that the training personnel concerned with advising the contractor in the field participate also in the organized courses.

34. The subjects that require special training of the contractor's staff are:

Site manager : _____	concreting;
	formwork;
	bricklaying;
	material transportation;
	steel-fixing;
	paving;
	excavation;
	supervision;
	safety;
	delivery of materials;
	use of equipment;
	location of temporary
	buildings;

	handling of materials.
Foreman	site and house; construction refresher courses; organization of construction; teaching methods.
Administrative Assistant	accounting; record keeping; typing; payrolls.

35. Practical training of the contractor's staff on the site usually answers the need for construction skills better than any theoretical course, while the group organizational pattern also provides for continual training through the process of repetition. The general framework and organization of construction as well as some specific subjects should be discussed and taught in advance. Practical training may then include the construction of demonstration house and on-site training before the beginning of each new stage.

36. While contractors and their staff do most of the actual construction, the manufacturers provide the materials and components that make up the physical facility. Therefore, training programmes should be designed to deliver technicians, who will later be involved in the production process of indigenous building materials, and are familiar with the production technology and the quality control procedures. This will ensure that the most efficient methods of production are used and the best quality of materials are produced.

37. For technicians, who are involved in the production of indigenous building materials, training should cover the following subjects: preparation of raw materials, production technologies, equipment, performance standards, etc. An example of a training programme for production of soil stabilized blocks is shown below in Figure 1.

Figure 1. Programme for training small-scale technicians, who are involved in the production of soil stabilized blocks

General

Testing for the suitability of the soil

- Particle size distribution

- Plasticity
- Compaction
- Linear shrinkage

Stabilizers

Production technologies

- Excavation and soil preparation
- Mixing
- Moulding
- Curing

Equipment

Performance standards

VI. PROPOSALS FOR A TRAINING PROGRAMME FOR ARTISANS

38. Building and civil engineering artisans are required for both new and maintenance work, and for work both on the site and in off-site workshops. The range of operations to be undertaken is very wide. No one type of artisans could possess the whole range of skills. Traditionally artisans have been divided according to the material with which they work, such as bricklayer, carpenter, plumber and painter, or according to operational group such as scaffolder, roofer and plant operator. The skilled artisans are usually assisted by unskilled operatives, frequently designated as labourers who assist by preparing for the operation, serving the skilled men with materials and clearing-up after the operation. Labourers are found principally assisting bricklayers, tilers and plasterers; trades for which heavy materials need to be handled. Other artisans are often assisted by apprentices or trainees who carry out the less skilled work. Labourers also carry out most of the site works.

39. Skill is a matter of degree. Broadly the skilled artisan has tool, material and operational skills, while the unskilled operative does not have tool skills and has the other skills at a lower level than the skilled artisan. The worker designated as unskilled mixes and lays concrete, prepares mortar, lays drains and paths, operates simple mechanical plant, handles materials and carries out other operations which require some element of skill.

40. It is advisable to divide the teaching process of artisans into two phases: basic preparation, and progressive complementary preparation. The preliminary phase of basic preparation permits the introduction of concepts and knowledge which will promote uniform criterion among the participants, enabling them to begin building

work without major difficulties. The second phase of instruction can be carried out along with the building of the dwellings, utilizing the knowledge and training acquired in the project building process.

41. Basic preparation comprises the following.

Introduction and general principles:

- Adequate organisation of the teams or crews in order to facilitate production work and increase the work yield. Utilization of participants who are semi skilled workers.

- Construction method whereby building is divided into stages. Sequence and size of building stages.

- Calendar of progress on the stages. Calculation of man-hours per building stage and per complete house or other project.

- Estimate of building materials per housing unit or other project element.

- Practical application of geometry in the construction of the project.

- Metric measures of length, surface and squared areas.

- Use of level, plumb line.

- Reading and interpretation of the project plans.

- Organization of work and assembling of materials.

Elementary technology:

- Building materials and their use. Features and properties of brick, hollow block, sand, coarse and fine gravel, building stone, wood, iron, tiles, fiber-cement sheets, etc.

- Agglomerates and mortars. Cement, lime, asphalt. Smooth mortar. 'Bleeding' mortar. Proportions or mixtures.

- Concrete. Proportions in volume. Influence of proportions on strength and cost. Preparation of the concrete by hand. Machine mixes, and use of mixer. Mixing and consistency of the concrete. Influence of water-cement ration on strength. Analysis and tolerance of impurities in the sand and mixing water. Pouring the concrete. Beginning and end of setting or hardening. Wetting and curing concrete. Aging of concrete and its relative strength.

- Laying brick and block walls.

- Laying or staking out house.

- Excavation for foundations.

- Laying foundations.

- Filling and construction of footings.

- Construction of concrete flooring.

- Erection of walls.

42. Progressive complementary preparation phase should include the following aspects:

- Reinforcing concrete. Building method.
- Method of prefabrication of reinforcements, and their placement on the work site.
- Preparation and placement of roof structure.
- Putting the cover or roof of the house into place.
- Putting in framework for doors and windows.
- Sanitary installations.
- Wall coverings, plaster, finishing, etc.
- Floor finishing. Tile, asphalt-tile, wood, etc.
- Painting. Oil, casein, water paints; whitewash, etc.

43. The personnel for carrying out the teaching process should be made up of the technical directors of the project (engineers, architects, builders), the master builders-instructors hired, and the leaders of the participant teams. The field of action for each of them will be his own section, block or team. They should all carry out their respective teaching programme within the general instruction plan approved for the entire project.

44. Very effective help for the teaching programme may be found in the form of aid from building instructors from specialized schools, former university students who are practising in the housing field, or advanced students from engineering and architectural schools and construction courses. To unify teaching methods and their length, the collaborators should follow the programmes outlined for teaching each one of the subjects.

VII. RECOMMENDATIONS TO AFRICAN COUNTRIES

45. In order for training of technicians and artisans to have an impact on the development of the indigenous constructions sector, consideration should be given to the following:

- Assessing the types of participants who require training, for example, contractors, building materials producers and personnel responsible for regulatory systems and the organizational aspects of the constructions industry;
- identifying those existing institutions or training programmes that have the potential to undertake additional training activities;
- identifying inputs to support additional training programmes;
- preparing comprehensive training activities based on the priority requirements of the domestic construction sector.

46. Policies in the development of practical training systems should consider issues such as:

- promoting on-the-job training programmes, using demonstration projects and field extension trainers;
- identifying appropriate target groups, such as master artisans, to undertake practical training and spread acquired techniques through apprenticeship systems;
- providing support for teaching aids, such as audio-visual equipment and illustrated manuals;
- mobilizing resources - national and international - for practical workshops and seminars and making those training systems accessible to both the private and public sectors.

47. National Governments should concentrate on:

- designating a focal agency or institutions to co-ordinate training activities, including the monitoring of international assistance;
- assessing facilities accessible to available training institutions or programmes;
- promoting collaboration among African countries on matters related to the training of technicians and artisans for the development of indigenous construction sector;
- assessing requirements for international assistance.

48. Policies in strengthening training institutions should emphasize the following:

- making training institutions and programmes easily accessible on a nation-wide basis;
- providing support in terms of material inputs from national and international sources, including equipment, information and manpower;
- reviewing curricula of training programmes in order to make them consistent with the requirements of the indigenous construction sector for training of technicians and artisans.

49. National Governments should support the development of the apprenticeship training system with attention to the following:

- selecting appropriate master artisans to be trained so as to provide knowledge on improved techniques to apprentices;