√ 46433

ECONOMIC COMMISSION FOR AFRICA

Inter-governmental Expert Group Meeting
on the Proposed African Institute for
Higher Technical Training and Research

Addis Ababa, 22-27 November 1978


Proposed African Institute for Higher Technical Training
and Research: Feasibility Study Mission Report

NOTE BY ECA SECRETARIAT


1.  Purpose of this Note

The purpose of this Note is to: (i) draw attention to some
of the highlights in the Field Study Mission Report by Messrs
N.J. Garber and C. Grey-Johnson; (ii) indicate ECA secretariat's
position on some of the basic recommendations in the report;
(iii) clarify some of the points and conclusions in the report;
(iv) indicate the extent the United Nations family of Organiza-
tions and other bodies intend to co-operate with ECA in establish-
ing and developing the proposed Institute as a regional project in
the event that member States decide in favour of the Institute; and
(v) outline specific follow-up action for the following 12 months.

2.  The Report

i.  Coverage

The field study mission visited 13 African countries and over
30 institutions. The countries visited included most countries
with technical education facilities likely to be important in the
choice of host and collaborating institutions. They included some
least developed and semi-land-locked countries. The average dura-
tion of visit was only 5 days per country but longer in the case of
those countries having more extensive and varied technical training
facilities. Obviously some more countries deserve to have been
visited in each sub-region and the duration of visit could have
been longer to achieve a more intensive assessment of facilities.
Even in some of the countries visited enough time was not available
to visit some institutions whose facilities and programmes were
known to be relevant to the project. It was not possible to include
the Sahelian countries largely because of travel cost constraint.
These limitations were due mainly to resource constraints rather
than other considerations.

M78-2218

## ii. Higher Technical Training

Both during consultations and in the text of the report it was always necessary to explain the concept of "higher technical training" as used for the Institute. It was particularly difficult to explain the concept to French-speaking African countries where vocational specializations are commonly constituted into separate institutions. Even for the English-speaking countries some element of clarification was needed, especially as to the relationship between the higher level technician, the engineer and the technologist. While ECA is not technically competent to make the fine distinction, it is still necessary to clarify the type of manpower the proposed Institute is to cater to. Paragraph 279 of the report has clearly defined the Institute's target groups and research goals.

Essentially, the Institute is to avoid doing and duplicating what national training institutions can do. Its job in technical education, training and research is to carry on from the level where national colleges of technology and polytechnics "stopped" and provide technical training opportunities to the highest level that modern technological development requires. In other words, the Institute will operate at post-college and post-polytechnic level and will develop training and research programmes equivalent to those of technological universities but having a practical bias to the requirements of the world of work.

Graduates of the Institutes will, therefore, range from the higher to the highest level of technical manpower. They are "technicians" only to the extent that they are technical personnel in the first place. In practice, the experienced technician trained by polytechnics will be taken on by the Institute to be trained to reach the higher and possible highest levels of technical and technological competence. Equally, the experienced engineer who is a product of the university but who has development problems to solve, will also be taken by the Institute for self-directed research, refresher course or technology familiarization course and may proceed with programmes that earn the equivalent of post-graduate degrees and diplomas. In this manner the so-called higher technician or technologist and the engineer may converge status-wise to the same top level, while maintaining differences in vocational specializations.

## iii. The mission of the Institute.

The Institute is conceived as a pace-setting, innovative training and research institution that is primarily concerned with helping African States to develop the required technological capability through personnel training and research for the accelerated transformation of African economies which should be internally self-sustaining and self-generating. To this end the Institute will have the task of training Africans to the highest level in technical skills and competence as required to master, apply, adapt and develop modern technology and through application and research endeavour to indigenize technologies traditionally indigenous to Africa.

Technological problems solving and innovation will constitute the principal basis of its training, research and consultancy programmes. It will play a leadership role to national technical education programmes through its technical teachers/instructors programmes training activities, curriculum and instructional materials, research and development consultancy in technical education development and management, and will be a pace-setter in technical training methodology.

Further elaboration of the nature of the Institute is found in the Annex to this Note.

### iv. The Institute and network of collaborating Institutions

While the proposed Institute as a regional institution is to have its headquarters and main operational base located in one African country, it is envisaged that the Institute would need to develop sub-regional training and research programmes as well as assist in implementing special national programmes. This is necessitated by the different stages and varying structures of African economic development. Sub-regional programmes would reinforce economic integration in particular sub-regions as well as provide training at a level and of a type best suited to the majority of countries in the area. This is necessary in order to make its programmes more relevant to development needs and to natural resource endowment.

In initiating and developing its sub-regional and national training and research programmes the Institute would need to take advantage and seek the collaboration of national education, training and research institutions with the best facilities and specialized programmes. Accordingly, the Institute will foster the operation of a network of national institutions that will regularly collaborate with it in implementing its programmes. Through this collaboration the Institute will reinforce the efforts of the national co-operating institutions to develop into "centres of excellence" in technical education in specific fields as indicated in paragraphs 265 and 303 of the report. Thus, the Institute with its sub-regional programmes or branches will constitute the hub of a network of sub-regional and national institutions providing higher level technical education and research programmes for Africa.

### v. Guidelines for Institute's Programmes

The Institute is to integrate its programme of activities, including its sub-regional programmes. This requires that its training of personnel, technology research, consultancy and advisory services, curriculum development, technical teachers/instructors training, production workshops and the development of teaching aids, laboratory equipment and prototype equipment be made mutually reinforcing, each being regarded as a vital component in the strategy for developing Africa's technological capability.

### vi. Production Workshop Units

In line with the emphasis that the Institute's training and research programmes will be problem-oriented and for practical application in production, distribution and services, it is necessary that the Institute establishes production workshop units or demonstration farms in respect of agriculture. While this arrangement should not reduce or eliminate practical industrial training as a basic requirement in its training programmes, the production workshops should serve three objectives: (i) enable students and trainees to learn while producing and learning as a regular feature of their programmes; (ii) enable the Institute to contribute to the production of tools, equipment and teaching aids badly needed in African technical schools, colleges and polytechnics; and (iii) enable both the Institute to earn some modest income from sales and the students to manage production and sales. Although this element has not been emphasized in the report the secretariat considers it a critical requirement in the design of the Institute.

### vii. Location of the Institute

Paragraphs 288 to 301 of the report dealt comprehensively with the choice of countries and institutions to host the Institute. The evaluation of the various criteria has given premium to educational, technical and economic consideration as it ought to do. Briefly the criteria may be elaborated as follows: (i) the national economy and its industrial base; (ii) industrial policy especially with regard to industrial training for technical personnel; (iii) educational infrastructure and institutional facilities; (iv) ease of external and internal communication; (v) climatic consideration; (vi) local capacity to make the Institute viable in terms of local demand in ensuring full use of the Institute's training programmes; (vii) educational and medical facilities for the Institute's staff and their family; and (viii) special contribution towards the support services of the Institute. In deciding on the location of the Institute it is recommended that premium should be attached to the aggregate advantages of the elements in the selection criteria.

## 3. Decisions

In considering the proposal four critical decisions must be made. These are:

i. Unreserved decision in favour of establishing the proposed Institute and for ECA to proceed with the necessary preparatory arrangements, including securing a resolution of the Conference of Ministers on the matter.

ii. Whether for the present and the next decade one or more regional institutions of the type proposed should be established for Africa. Having regard to the high cost in capital outlay and running cost, the need for a viable institution, the possibility of the Institute developing sub-regional programmes in collaboration with a network of

African institutions and the fact that a similar
institution is already being established in Libya for
Arabic-speaking States, the secretariat recommends that
only <u>one</u> regional Institute should be established now
and for the foreseeable future.

iii. The proposed Institute should be a bilingual institution
and should offer its courses in English and French.

iv. The Institute should be an autonomous institition,
having its own separate existence financial and programme
autonomy, a legal personality, a Governing Council and an
Advisory Board or Committee but working in close collabora-
tion with its host institution for the purpose of sharing
common services as well as collaborating with a particular
university in the host country and with appropriate
institutions in other African countries hosting its sub-
regional programmes for the purpose of accreditation of
its diplomas and certificates.

## 4. <u>Co-operation with other regional technology institutions</u>

The Institute is to collaborate with all African regional and
sub-regional institutions involved in technical personnel training
and technology research. In this regard the Institute will develop
special relationship with the African Centre for Technology in
respect of the training of technologists and research for the
adaptation and development of technology, including improvement of
indigenous technology. It will also co-operate with the proposed
Regional Centre for Design Engineering and Manufacturing. To this
end the Institute may serve as an instrument for the realization of
some of the objectives of the latter regional institutions in regard
to training and research.

## 5. <u>Support by the United Nations family Organizations and by other bodies</u>

The secretariat has received definite assurances of support for
the Institute from the United Nations family of Organizations if its
establishment is approved by member States. In this regard UNDP has
agreed to the inclusion of the project Institute in the regional IPF
under ECA management for financial support during the preparatory
phase 1978-1981. UNESCO, UNIDO, ILO, FAO and WHO have all agreed
to co-operate with ECA in realizing the project Institute and are
currently considering the manner in which their contributions to
the implementation can best be realized.

The Commonwealth Secretariat, London, as indicated in paragraphs
251 to 256 of the report, has positively indicated willingness to
join forces with ECA in realizing the project Institute. Specifical-
ly it has agreed to combine with the Institute in establishing and
developing a technical teachers/instructors training programme for
Africa. The French Agence de Coopération Culturelle et Technique
is also expected to co-operate with the Institute. Other bilateral
organizations will be approached to assist with the realization of
the Institute.

6. **Follow-up Action through December 1979**

Following a positive decision in favour of the establishment of the Institute, ECA will proceed with follow-up action as follows:

i. Incorporate the specific suggestions and contributions of interested specialized agencies in the project document for finalization and submission to UNDP.

ii. Secure a team of technical experts in institution building and design to undertake the technical feasibility studies in collaboration with the host country as a basis for planning the buildings, training and research programmes of the Institute.

iii. Draft resolution on the Institute for the consideration of ECA Conference of Ministers (March 1979).

iv. Recruitment of a UNDP Project Manager (July 1979).

v. Negotiate host facilities and other preparatory arrangement with the host country and institution(s).

vi. Mobilize resources for the Institute, especially through bilateral sources.

vii. Convene the first meeting of the Governing Council and Advisory Board of the Institute (December 1979).

viii. Take other appropriate action as may be necessary for the establishment and operation of the Institute.

## African Institute for Higher Technical Training and Research: Its scope and Mission

Industrial process is essentially the conversion of natural resources into semi-finished and finished products. Trained manpower is an essential input in the conversion process. The structure of course offerings in third level education in Africa is remarkable for its lack of adequate provision of facilities for the education and training of Africans to perform this function. The bulk of African technologists seem to be trained for the repair and maintenance of structures and imported equipment rather than for their manufacture and the widespread policy of industrialization through assembly plants merely encourages the persistence of this weakness. There is, therefore, little possibility of accelerating industrial growth in the Region (even to achieve modified LIMA targets) without a massive effort at correcting this bias. One of the functions of the Institute will be to undertake the education and training on a large scale of professionally qualified technologists to meet a wide spectrum of industrial needs. The pattern of intake will reflect, but not exclusively, the priorities in the ECA's work programme in industry, viz. chemicals, metals, engineering, building materials, food and forest industries, and the upper reaches of the related skill profiles that will emerge from the project on this subject (see below). It is expected that the African Fellowship and Training Fund will provide support for some of the students pursuing critical courses (e.g. design engineering, the science and technology of materials, production engineering, tribology, agronomics) at the Institute.

Other important functions of the Institute will include:

i. Research in such important but neglected areas as: skill transference, improvement and multiplication; the adaptation of rural migrants to industrial employment; factors affecting the processes of technological invention and innovation in Africa; factors affecting labour productivity; social attitudes in industry, etc.;

ii. A substantial research programme in the area of what is currently described as 'appropriate' technology, in particular the up-grading of traditional technology.

iii. Serving as reference centre on educational technology.

iv. Experiments with bridging courses, designed to shift students in non-technological education courses to courses in technological education. This should reduce the level of graduate unemployment, increase the supply of urgently needed technical manpower, contribute towards acceleration of industrial growth, and save foreign exchange on imported expertise.

v. training job analysts, technical teachers and instructors and research into open-ended technical training.

vi. Consultancy services to the education sector, for governments and to the 'business sector' both public and private.

Its major outputs will include front-line supervisors, personnel for trouble-shooting and technical entrepreneurs. The role of the technical entrepreneur in technological adaptation and innovation is by now well known. For accelerated industrial growth on a broad front large numbers of such men and women will be required, and technical courses will need to be supplemented with elementary courses in business organization and management.

The Institute will establish working links with such regional centres as the African Centre for Technology, the Industrial and Engineering Design and Manufacturing Centre, the African Centre for Industrial Consulting, Engineering and Management as well as with the International Centre for Advanced Technical and Vocational Training in Turin (Italy).

A fundamental feature of the Institute will be the institutional formalities it creates or working arrangements it makes to enable its students to benefit from direct experience in actual and simulated production activities in its production workshop and in outside work situations.

It will thus be seen that this is not in any way intended to be a conventional polytechnique. Its role will be that of innovator and pace-setter and it will, therefore, be expected, when fully developed to run special courses and demonstration centres for teachers of technical education.

It will be clear that its location must be very carefully decided upon to avoid an environment and associations which inhibit its innovative function.

Consultations are already being made with UNESCO, ILO and UNIDO for their collaboration and it is envisaged that these agencies and other organizations will be associated with the establishment and development of the Institute.