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PROGRAMME PROPOSALS FOR MEETING AFRICA'S REQUIREMENTS OF CRITICAL MANPOWER NEEDED FOR DEVELOPMENT

(prepared by the secretariat)

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INTRODUCTION

1. The African economic and social situation, as now generally understood, calls for deliberately planned and carefully executed action in order to uproot the hinderances to progress and firmly instal measures which experience has shown to be reliable means to effective development. The verdict of comparative studies over years is that the continent occupies the rear seat in terms of man's ordered actions to improve himself and his environment. Where the situation in many parts of the world could be labelled "high grade", Africa's record is unenviably that of "lowest" - be the factor considered that of the world's scale of social development generally, adult literacy, percentage of school-age population enrolled in formal education, life span or per capita income. On the other hand, where factors which restrain progress have been reduced to insignificant levels elsewhere, Africa claims the highest existing rates - population growth, incidence of morbidity and mortality, etc.

2. The only proven way to introduce and develop better conditions is through man's mastery of his environment. In this process, there is no doubt that availability of physical and financial capital is one of the most important prerequisites but the lesson from the experience of advanced and semi-advanced nations is that the prime lever in the process of accelerated development and technical progress is rather "the capacity acquired by the people, through education, training and research, to apply science and technology (including management) to their resources for potential development". ^{1/} It is worthy of note that in regard to this same question of the human factor in the process of economic growth the Director-General of the ILO once emphasized: "We have learned the lesson that although new financial investment is of course necessary in developing countries, it may be ineffective, or even wasteful, if there is not present the capacity to use capital. This capacity to use it includes, chief and foremost, the education and skills in the labour force of the kind needed to make new equipment productive. Thus the lack of competent trained personnel is, as so many have now come to recognize, a central problem in nearly every field of economic and social development and in nearly every developing country." ^{2/}

3. The African position is one of acute shortage in the supply of those capacities and skills which we would refer to as "critical manpower" needed for development. They are in brief middle- and higher-grade skills, the insufficiency of which would retard meaningful and accelerated improvement in the vital areas of agriculture and industry. Other papers before the Working Party would deal with the details of the requirements of these

^{1/} ECA document E/CN.14/WP.6/3/Add.1 of 26 August 1966: "Recent Developments in Education and Training", p.2.

^{2/} Godwin, F.W., Goodwin, R.N. and Haddad, W.F. (ed.): The Hidden Force, A Report of the International Conference on Middle Level Manpower, San Juan, Puerto Rico, October 1962, New York, 1963, p.29.

trained manpower; nevertheless, it is considered necessary to provide here some illustrations of the magnitude of the problem, some of them already highlighted in ECA studies, in order to bring into focus the urgency of the need for well-conceived "revolutionary" programmes of action to ameliorate the situation.

4. In the West African sub-region "all countries of the area suffer from serious shortages of essential high-level technical, professional and managerial personnel, from inadequate supplies of middle-level supervisory, executive and technical personnel...". ^{1/} When we turn to the East African sub-region, the features of the critical manpower situation are similar - "an acute shortage of graduates of universities and technical institutes, particularly those with professional training and an over-supply of jobless primary school leavers". ^{2/} Critical manpower shortage is equally as acute in the Central and Northern African areas.

5. In actual quantitative terms reliable statistical data on demand and supply is usually not available. However, the economic plans do give some information. The following figures for a few countries, by no means the worst placed, indicate the enormous gap which is expected between their additional demand and potential supply, in regard to the needs of their economic development plans, for manpower category I (persons with university education, professional training or equivalent experience) and Category II (persons with one to three years post-secondary education or vocational or technical training): ^{3/}

Country	Plan period	Additional demand	Potential supply	Shortfall	Shortfall as % of demand
Algeria	1966-73	93,000	25,000	68,000	73
Tunisia	1965-68	21,000	16,000	5,000	24
Ivory Coast	1963/64-1969/70	21,708	4,800	16,908	77.9
Cameroon	1966-71	9,656	6,134	3,522	36.5
Tanzania	1964/65-1968/69	9,460	6,363	3,097	32.7
Zambia	1965-70	5,750	1,590	4,160	72
UAR	1965-85	2,044,412	602,700	1,441,712	70.5
Ethiopia	1968-72	13,646	9,872	3,774	27.5

- ^{1/} ECA document E/CN.14/INR/113 of 1 July 1966: "Trained Manpower Requirements for Accelerated Economic Development in the West African Sub-region", p.5.
- ^{2/} ECA document E/CN.14/II/ECOP/9 of 15 October 1965: "Trained Manpower Requirements for Accelerated Economic Growth in the East African Sub-region", p.4.
- ^{3/} Abstracted from Working Party document E/CN.14/WP.6/18 of 10 June 1968: "Africa's Economic Transformation and Implications for Educational and Manpower Development", Table 1.

6. In terms of overall assessment, a United Nations survey has indicated that in the industrial sector alone, Africa would by 1975 require an estimated total of 33,000 engineers and scientists and 83,000 technicians. Of these some 31,000 engineers and 73,000 technicians would have to be trained by 1975. ^{1/} It should be borne in mind that these estimates might indeed prove to be conservative in view of the statistically difficult basis of forecasts and the scale of actual expansion in the economic and social fields.

7. The existing high- and middle-level skills producing systems in African countries have been unable to satisfy requirements both in quantitative and in qualitative terms. In order to fill the gap there has been a general recourse to the importation of foreign manpower on a vast scale. Studies indicate, for example, that expatriate personnel constitute a high proportion of the upper level of the public services and public corporations of French-speaking West African States. In most African countries expatriates are even more predominant at the senior level of the private sector. For instance, Nigeria's high-level manpower assessment covering the 1963-70 period showed the expatriate component "of the senior category of trained manpower employed in the private sector" as 58.7 per cent in 1963, "excluding teaching and research, as against only 22.2 per cent of similar category in the public sector". ^{2/}

8. This recourse to the use of expatriate staff is no less in other African sub-regions. At present the volume of this category of development agent is increasing rather than diminishing in the continent as a whole and the trend is that the rate of increase is even likely to be faster if the various development projects are not to encounter significant set-backs either through being abandoned or drastically modified in depth and range.

9. While it remains true that within the foreseeable future the employment of experienced very high-level foreign experts cannot be altogether eliminated, it is desirable and of paramount importance from many considerations that African countries develop and execute carefully prepared programmes which would enable them to be reasonably self-sufficient, both quantitatively and qualitatively, in the production of the skilled manpower needed. Furthermore, apart from the fact that suitable experts are expensive to obtain, it is uncertain that the advanced countries

^{1/} "Training of National Technical Personnel for Accelerated Industrialization in Developing Countries", United Nations document E/3901/Add.1, p.25.

^{2/} ECA document E/CN.14/JNR/113 of 1 July 1966: "Trained Manpower Requirements for Accelerated Economic Development in the West African Sub-region", p.17.

would, in fact, be able "to provide, in terms of the realistic needs of the whole world (that is, with the object of accelerated development and structural economic change which takes reasonable amount of population growth and living standards) the equipment, teachers and training opportunities which" they "themselves require to meet their own rapidly expanding needs". 1/

10. It is, therefore, clear that African nations must have to devote attention to the evolvement of systems of education and training which would ensure the fulfilment of the objective of satisfying the manpower needs of their economic and social development plans. It is the considered view of the ECA secretariat that parallel action programmes need to be adopted at the national and multinational levels, excluding continuing utilization of bilateral and international offers of opportunities for training in industrialized countries, although the nature of such training must also generally conform to the needs of national, sub-regional and continental development of major priorities. It should be mentioned that any meaningful action programme for the production of skills presupposes:

- a satisfactory reflection by training programmes of the manpower needs of national and sub-regional development plans;
- the assessment of the existing middle- and high-level stock of manpower resources;
- appraisal of the existing training facilities in terms of their capabilities to provide for most of the national needs - quantity, quality and skill mix being taken into full consideration;
- an effective central co-ordinating training machinery to ensure maximum use of facilities, concerted action by various training bodies, elimination of unnecessary wastage and to formulate national strategy for human resources development and utilization;
- action on existing wages and salary structures with their tendency to accord higher esteem to white-collar occupations - at least measures encouraging parity of status would be desirable.

NATIONAL ACTION

11. In regard to national possibilities, the Working Party would wish to consider the advisability of making proposals to the next session of ECA on the following training proposals:

1/ ECA document E/CN.14/WP.6/3/Add.1 of 26 August 1966, p.3, para.9.

- (i) legislation-based co-operation between government and industry to train middle and higher industrial manpower;
- (ii) high-level skill development loans;
- (iii) planned utilization of foreign skills.

Proposal I

Legislation-based co-operation between government and industry

12. It is conceivable that governments could persuade industries to take measures, on a purely voluntary co-operative basis, to intensify training in their existing institutions, expand opportunities to provide greater volume of trained persons and improve the quality of products, restructure the contents of courses to meet the needs of national development, establish common frame of reference for similar courses, introduce new courses as may be required by changes in technology and modernization and create new common training institutions where necessary.

13. It would be proper within such voluntary co-operation for governments to provide financial aid to supplement employers' expenses to meet capital and operational costs, make available to industries any information from researches or special studies on the development of training methods and aids and even offer rent-free physical facilities such as buildings.

14. The main set-back in this line of action is that the disincentives are generally strong. Establishments which are usually in competition and whose success may often depend on the 'little secrets' in possession of their skilled personnel would on the whole be reluctant to enter into ventures which would directly or indirectly remove the very basis of their advantages. There are the problems of participation of small-scale employers without fears of losing their ablest men through attractive offers by bigger firms. Finally there is the special position in Africa where there is generally a cleavage between the nascent indigenous and the dominant well-established foreign businesses. It is not so easy for these two groups to identify common interests, not to speak of agreeing on national interests.

15. While voluntary co-operative training action among industries could, therefore, be seen to be within possibilities, it should equally be recognized to be a likely ineffective means of meeting African needs for accelerated production of skills.

16. A method of devising a training pattern combining the advantages of voluntary co-operative approach with positive incentives to action is through limited legislative measures. In this regard the ECA secretariat considers that the system which has been used with success

by Brazil and now adopted by the United Kingdom ^{1/} merits particular examination. It is noteworthy that when Brazil resorted to the system her needs for intermediate-level technicians were as acute as those now confronting most African countries. As in Africa, she was handicapped by the traditional academic education, inadequate emphasis on science and technology and the inadequacy of courses for the middle-level personnel which prevailed. The wage structure favoured the white-collar occupation which carried higher social status with the result that persons in middle-level industrial occupations tended to be regarded as those with lower mental capacity.

17. The Brazilian system for eliminating the penury of industrial skill was a full recognition of the indispensable role of firms in the development of a larger and more efficient stock of middle-level skill but it was equally an endorsement of the view that a deliberate and compelling action was necessary to ensure participation and the achievement of needs in terms of skill mix, quantity and quality. One characteristic feature of the Brazilian Intensive Training Programme for the Preparation of Industrial Labour ^{2/} was that the National Service of Industrial Apprenticeship (SENAI), established in 1942, was financed by a one per cent payroll levy on industrial firms, refundable to those concerns providing adequate in-service training for their workers. The part played by this institution in providing Brazil with satisfactory fund of trained skill is regarded as very remarkable.

18. It is true that certain factors present in the Brazilian situation might be missing in most African States, e.g. immigrant settlers from Europe, other parts of South America and Japan who were the source of important contributions of financial resources and skills. ^{3/} It is not thought, however, that such factors diminish the outstanding effectiveness of the scheme, patterns of which have since been set up in various Latin American countries: CORNET in Argentina for industrial training, SENA in Columbia and INCE in Venezuela both devoted to training in industrial, commercial and agricultural sectors, and SENATI in Peru providing basic training to young persons and adults in industry - including supervisors and instructors. ^{4/} Brazil also operates SENAC for the commercial sector.

^{1/} See UNIDO document ID/CONF.1/B.1 of 12 May 1967: "The Supply of Skills to the Industrial Sector in Developing Countries", by Angus Maddison, p.5.

^{2/} See Annex I: "The Brazilian Intensive Training Programme for the Preparation of Industrial Labour" (abstracted from ILO's Training for Progress, No.4, Vol.5, 1966).

^{3/} Angus Maddison, ibid., p.17, para.44.

^{4/} United Nations document E/3901/Rev.1/Add.1 and 2: "Training of National Technical Personnel for the Accelerated Industrialization of Developing Countries", Annex B, p. 114.

19. In the belief that co-operation with and between employers is not only an effective but one of the best means of planning for the middle-level manpower needs of a country, ECA proposes that schemes which should be considered, as a matter of urgency, by the African countries should have the following essential features:

- legislative basis for co-operative training;
- effective incentive and constraint to ensure participation;
- centralized national authority with adequate arrangements for regional or local training activities;
- satisfactory relation between theoretical knowledge and practical experience, with emphasis on the latter.

20. The following model is submitted to enable members of the Working Party to make a proposal to the next session of the ECA in the light of the foregoing comments and their knowledge of African conditions:

Title of
organization:

National Corporation for Industrial and Commercial
Apprenticeship (NCICA) 1/

Basis:

A national industrial training act which should

- (a) impose a levy of about 1 per cent of the total annual wage-bill on employers with 10 or more employees;
- (b) provide for firms operating approved training programmes for ten or more persons and showing an annual training expenditure of not less than about 1 per cent of the total wage-bill to be exempted from contribution although there should also be a provision to allow them to join freely if they so desire;
- (c) provide for government (including regional or State) participation through subvention of not less than 5 per cent of total education budget at national, regional, State levels or as much as half the total contribution by employers, whichever is higher.

1/ Representation on this body should at least include employers (private and public), ministries charged with responsibilities for economic planning and development; industrial development; technical education; labour and employment; also central trade union organizations.

Coverage: Public, quasi-public and private bodies employing ten or more persons.

Organizational structure: Provision for training centres in all important towns, with possibilities for area specialization.

Training pattern:

- (a) Training to be organized by industrial branches rather than by occupation.
- (b) Apprentices: four to five years' course organized on the basis of first year: 7 months' theory, 4 months' practical, one month leave. Remaining 3 or 4 years: 4 months' theory, 7 months' practical, one month leave.

Senior technicians: should require at least two years' practical experience after a successful apprentice course. Duration to be one year on the basis of 3 months' theory, 6 months' practical and 3 months' theory.

Foremen, supervisors: at least one year practical experience after senior technician course on the basis of 2 months' theory, 5 months' practical and 2 months' theory (duration 9 months).

Instructors and managers: persons of between 25 and 35 years of age with at least five years' work experience or work/training experience after the senior technician course. Duration of course one year with a total of six months' theory and six months' practical. Training should include most modern methods of training and industrial production, general teaching methods, personnel relations, etc.

In the early years of the scheme there should be opportunity for persons already employed as technicians to attend courses at the level for senior technician and higher.

Trainee recruitment:

- (a) Mainly sponsored by industries or establishments which should be under obligation to pay a reasonable percentage of the full wage in the case of apprentices on the basic course and full wages in the case of other employees

on follow-up courses. These industries would also be under obligation to co-operate in providing opportunities for practical experience and absorb trainees on completion of courses.

- (b) Limited non-industry sponsored but on State awards as reserve for wider needs, e.g. unforeseen increase in needs over forecasts of employers, new establishments, etc. It should be emphasized that the number of this category of trainees must be strictly controlled and closely related to studies of trends in industrial development and overall manpower requirements. This would avoid possible frustration which could arise from the production of an unreasonable number of skilled men for whom employment would not be available with only minimum delay.

Administrative
arrangements:

Must provide for central, regional or area authorities to:

- administer fund and training centres;
- arrange for training equipment in co-operation with employer participants;
- evolve and ensure maintenance of standards;
- organize tests and award certificates;
- follow industrial and commercial developments and take steps to adapt contents of courses to suit;
- help industrial and commercial in-service training by evaluating and advising on courses;
- organize and control corps of training inspectors;
- ensure training satisfactorily reflects economic and social development needs;
- seek through appropriate channels the advice of competent United Nations Organizations and specialized agencies on the structure, content and adaptation of courses.

Proposal II

Advanced training loans system

21. The use of students loan is probably not entirely new in Africa but its potentiality as a means of concentrating studies on areas of critical need has not been sufficiently exploited. Scholarship awards are widely practised in most countries but the motivational forces in such awards have not often emerged from a conscious plan to provide those high-level skills lacked by African countries but indispensable in the drive for economic growth and social progress. It is not unlikely that the scarcity of financial resources and over-emphasis on the immediate end-products of expenditures has also to some extent hindered the recourse to wider development of student loan systems.

22. The bold approach of Columbia illustrates one way in which a loan system could be effectively run at the national level. In 1950 this country established and in 1952 began operating its Institute for Advanced Training Abroad (ICETEX). This was an autonomous governmental organization whose essential characteristic was the setting up of a revolving fund for granting loans to students pursuing advanced studies. An outline of ICETEX is set out in Annex II.

23. It should be noticed that this measure for meeting the shortage of high-level manpower is organized on a central national scale. This would avoid unnecessary duplication. The scheme also gives adequate place to the obvious need for the evaluation of present and future national needs, although this service could be provided by another Government arm, e.g. the Economic Development and Manpower Planning Authority. Supervision of the progress of those on grants, satisfactory placing to avoid the frustration and possible brain drain which often accompany failure to obtain suitable employment, the use of grants by commercial banks and the harnessing of the financial capabilities of the wider public through campaign for funds are also functions of the institution.

24. ECA believes that a purposeful application of the loans system, adapted to local circumstances, would be a major contribution in bridging the gaps between shorter- and long-term demand and supply of high-level personnel. It would of course be feasible to integrate such a scheme and that for providing critical middle-level personnel in one broad venture. The main danger in such an approach (and one capable of frustrating the main objective), is that middle-grade skills might ultimately be regarded as less important and, therefore, fail to receive the emphasis and impetus to which they should have full claims in any effective action programme for up-grading skills generally. On the other hand, it is foreseeable that certain services, e.g. statistical and research, could very well serve the needs of the two. Such services which need not be part of any of these systems could be a function of the Manpower Planning Authority which would necessarily operate in co-operation with them. Whatever the system chosen, provisions in an effective loan project should include:

- linking of awards mainly to areas of acute manpower shortage, as well as foreseen directions of development where shortage of relevant skills is likely to occur;
- proper incentive for award winners to work ultimately in appropriate fields, including industrial and commercial enterprises, and effective disincentive to defection after studies;
- the harnessing of financial resources on as wide a front as possible; and
- nation-wide organization with central direction.

25. The Working Party would wish to examine the following as an action model, which countries could modify to suit local circumstances, in cases where it is decided to operate a loans system as a relatively self-contained project.

Title: National Students Loan Board Act 1/

Providing for:

- (a) the establishment of a revolving fund;
- (b) the objective of high-level manpower interest-free loans for studies in higher scientific and technical institutions within the country and abroad;
- (c)
 - immediate total refund with high interest where a loan-supported student works for less than three years or refuses, directly or by the implications of his actions, to work at all in an approved field or in an organization in which he is placed;
 - refund of whole loan with minimal interest where student works for at least three but less than five years in an approved field or in an organization in which he is placed;
 - refund of only 50 per cent of loans where student works in an approved field in the country for a given period, e.g. five years, on completion of studies;

1/ The composition of the Board should include at least ministries of education, economic development and manpower planning, labour, industries, trade, commerce and the universities and university colleges.

- no refund at all where such a period of actual post-studies employment is at least ten years.

Structure:

To include regional or State or local arrangements for the identification of medium- and long-term manpower needs of such areas.

Sources of fund:

- (i) grants by central governments as might be necessary;
- (ii) grants by regional or State governments as might be necessary;
- (iii) interest-free loan by banks;
- (iv) fund-raising campaign within country.

Administrative arrangements:

Should provide for executive director to:

- provide list of applicants for awards on merit by the Board on the basis of priority needs of the country;
- select the best scientific and technical institutions for training;
- collect and, if requested, disseminate information on studies in specialized institutions abroad;
- co-ordinate all technical assistance and scholarships offered by foreign nations;
- co-operate with private enterprise;
- maintain statistics of graduates from higher educational institutions, indicating specialization, graduating years, ages, courses fully completed, degrees or diplomas received, cost per student, per career, per specialization; drop-outs, etc.;
- supervise the progress of students, helping to arrange for opportunities for organized practical work during holidays;
- arrange for employment placement of winners of awards on completion of their studies;

- develop appropriate pattern of bonding agreement whose provisions would include conditions for the repayment or non-repayment of loans;
- provide possibilities within the law for firms to make direct loans to students bonded to serve, on the completion of studies, for appropriate number of years and providing for a regressive rate of loan refund based on the length of services rendered.

Proposal III

Planned utilization of foreign skills

26. As has already been indicated elsewhere, African countries are at present employing expensive foreign skills on a vast scale and the volume of such employment is likely to continue to increase in the future. Suggestions have been made above for national action programmes mainly to meet future shortages of middle- and high-level skills. In the meantime, it is considered essential that the employment of foreign skills should also be properly planned and controlled.

27. In this context the Working Party would need to consider the actions taken by Japan as interim measures in its hours of greatest need. These actions may be reduced to:

- importation of trainers on fixed contract basis;
- programmed training in foreign industrial and commercial establishments;
- less reliance on "free" technical assistance;
- investors' training obligations.

28. Japan sent its nationals to study in various industrially and technologically advanced countries while at the same time employing foreigners to modernize all sectors of its economy. Government officials and businessmen went abroad "to pick up foreign ideas". The cost of foreign technicians was very high but the Japanese themselves paid for these and all foreign aid, thus making it easier to get them to conform to the wishes of the country instead of allowing them to impose ideas more suited to foreign circumstances. While the Japanese use of foreign personnel, as a short-term expedient, helped to launch her rapidly on the path of self-sustaining growth, India which employed more than twenty times as many foreigners in Government and business in the

colonial period did not obtain the same satisfactory results. ^{1/} The fact that as an independent country Japan knew how much she paid for the skills she imported, which she thus carefully selected and controlled, may have contributed in no small measure to this difference in results.

29. Most African countries have no doubt already evolved measures to fix the level of importation of foreign skills but it is not certain that the allowed levels of importation are tied to fixed periods or that the latter are in turn linked to planned training of nationals. On the whole, foreign enterprises are permitted to import skills where they are not available locally on the understanding that national counterparts, for ultimate replacement, would be trained but there is often no effective supervision to ensure that the indicated skills are in fact the ones imported or that adequate steps are consequently taken to train nationals.

30. Foreign investment laws in various African countries are also known to contain clauses placing obligations on new enterprises to train nationals. These provisions have, however, frequently remained dead letters, owing to the general lack of supervisory arrangements to ensure their effective implementation. It cannot be over-emphasized that an adequate machinery for control and periodic reporting is a necessity to enable this process of skills development to be most fruitfully exploited.

31. ECA proposes that the importation and control of foreign skills should be the subject for a special panel of government. Such a panel should include representatives of services of government charged with manpower planning, technical training, labour and employment. This body should examine closely the existing practices and devise patterns to eliminate processes which could indirectly frustrate the objective of the employment of nationals and indigenous manpower development through undeclared but practiced preferences for foreign skills. Its responsibilities should also include the formulation of methods for ensuring the implementation of training obligations incorporated in investment laws.

INTRA-AFRICAN ACTION

32. In spite of financial and other difficulties there is now no doubt that intra-African co-operation both on continental and at sub-regional levels is vital for effective overall development of specialized high-level skilled manpower. It has long been recognized that many countries, because of their size, cannot support a proliferation of institutions for the production of skills which may not be required in very

^{1/} Angus Maddison: "The Supply of Skills to the Industrial Sector in Developing Countries", pp.6 and 7.

large numbers but which even in small numbers are nevertheless very necessary. The competition for scarce funds by other needs does not justify the construction and maintenance of institutions whose potentialities are unlikely to be fully utilized. The development of visible sub-regional economic activities requires high- and middle-level African manpower if African interests are to be fully satisfied. Apart from other problems, it is likely to over-stretch the financial resources of the African States if they were to endeavour not only to train for the needs of their economic and social development plans but also to make allowances for surplus in variety, quantity and quality to meet the requirements of regional or sub-regional development projects.

33. This need for intra-African collaboration which is the obvious conclusion from a consideration of the foregoing difficulties was recently re-echoed by President William V.S. Tubman of Liberia when, in his opening address to the Ministerial Preparatory Meeting (1968) for the Conference of Heads of State and Governments of West Africa, he emphasized that there was "much room and an urgent need for regional co-operation in the field of research and training". 1/ The decision of the OAU in September 1967 to establish centres of excellence for training and research in applied scientific disciplines in Africa was aimed at meeting national and multinational requirements of the continent. Two conferences, convened by the African-American Institute and separately held in the second half of 1967 by West African Universities' representatives (Sierra Leone) on the one hand, and the representatives of East and Central African Universities (Kenya) on the other, considered possibilities of intra-African co-operation at the university level and endorsed the same view as represented by the East African affirmation of "the desirability of maximum co-operative utilization of university resources at both under-graduate and post-graduate levels available within Africa for the purpose of helping to meet the manpower requirements in African countries". In order to avoid unnecessary overlapping in administration and wastage and further to ensure maximum utilization of financial resources which may become available, there should be maximum co-ordination between the various proposals of the representatives of universities, the plans of the Organization of African Unity and the demands of regional or continental economic projects.

Proposal IV

34. Following a study of the need for high-level personnel for continental and sub-regional development projects, the financial prerequisite for the support of centres of excellence, the demand for special measures to encourage development-oriented research activities of African interest, ECA considers that one approach likely to prove rewarding is the institution of an African scholarship and fellowship fund. A draft project for this fund is attached as Annex III.

1/ See document CEI/HSWA/DOC.11/Rev.1, Annex A, p.6: Opening Address by President William V.S. Tubman.

35. A competent organization, preferably outside the direct control of any one of the African countries, but one in which, at the same time, each of them has a direct and continuing close interest and with which each closely collaborates in matters relating to its development plans would be best suited to help to devise and execute intra-African plans for high-level manpower development. ECA is prepared to play this role if member States so wish.

36. It would be noticed that the major purposes of the fund include:

- financing the training of manpower critically needed for continental and sub-regional projects;
- supporting research and training personnel;
- provision of support for development and growth of "centres of excellence" for research and training among African institutions through financing trainees from other African countries;
- provision of means for financing special job experience-oriented training for Africans in African and overseas institutions and industrial establishments; and
- provision of means to enable African experts to participate in study tours in Africa or conducted overseas by international organizations or other bodies such as the Economic Commission for Europe.

37. It is thought that it would be in line with African initiative and continental self-help for the ECA to initiate the establishment and direct the operation of the fund and the scheme, particularly as it is well placed on a continuing basis to see the plans and the needs of Africa on the continental, sub-regional and national levels. An international organization providing the bulk of the fund, e.g., Special Fund, could appoint the programme officers while specialized international executive bodies such as UNESCO, UNIDO and ILO could be invited to provide technical advice and/or fellowship support. It is within the scheme for ECA to provide host and secretarial services and assist with its administration.

38. It is the view of ECA that the operation of this proposal should be on a very modest level in the first five years at least. Thus it is proposed that awards in fields designated as critical should be restricted to 400 during the first five-year period. Annex III also shows the estimated operational cost, excluding administrative costs.

39. The Working Party would wish to examine the principles and general characteristics of this project and make proposals to the next session of the Commission.

40. In conclusion, it should be mentioned that the four-item action programme proposed does not by any means exhaust possibilities. Nevertheless, it is considered that the parallel exploitation of all of them would certainly and reasonably bridge the gap between the demand and supply of critical manpower needed for the development of Africa's natural resources potentials.

41. It would be observed that these proposals are restricted to forms of schemes. No attempt has been made to discuss the content of training programmes themselves. While this is the case, it needs to be mentioned that this particular aspect of training arrangement would need very careful examination and planning. In this connexion, it would be desirable to avoid too narrow specialization in basic training programmes. Schemes should be designed to provide for full exploitation of the advantages of a broad-based initial training, thus contributing to flexibility in coping with technological changes in industrial activities.

ANNEX I

THE BRAZILIAN INTENSIVE TRAINING PROGRAMME FOR THE
PREPARATION OF INDUSTRIAL LABOUR

(Abstracted from ILO's Training for Progress, No.4, Vol.5, 1966)

Decree No. 53,324 of 18 December 1963, created the Brazilian Government's Intensive Programme for the Preparation of Industrial Labour (see Annex I-A). The Programme was given three main objectives:

- (a) to specialize, retrain and up-grade personnel employed in industry;
- (b) to train new personnel for industry; and
- (c) to qualify technical teachers and administrative personnel for industrial training, as well as instructors and supervisors of training in industry.

A number of relatively unique features were incorporated in the plan:

- It was essentially to retrain or up-grade technicians and skilled workers already in employment - people other than those prepared in the regular school system; it was not to duplicate training already available in public and private schools and centres. A great many of the courses - those for skilled workers - would therefore be short.
- It was to take into account the manpower needs of industry, as well as industry's ability to train and prepare its own skilled workers.
- It was prepared to utilize the unused capacity and facilities of the federal and State schools of industrial education, the training centres of the Serviço Nacional do Aprendizagem Industrial and the parallel network of schools for training commercial employees set up by the Serviço Nacional do Aprendizagem Comercial (SENAC), as well as those of private schools and other organizations engaged in training activities.
- It was not in any way limited in its choice of teaching methods and techniques.

An initial training target was set: an output of 46,185 persons trained at the following levels:

Skilled workers	32,450
Supervisors or foremen	3,100
Junior technicians	4,155
Industrial technicians	4,170
Teachers, instructors and training directors .	2,310

The time needed for accomplishing this task was estimated at 20 months. Since the highest concentration of specialized manpower was in electronics, electrical engineering, mechanics, welding and chemicals, top priority was given to courses in these fields. It was recognized, however, that there were wide differences between regions, and consequently the regional co-ordinators were given considerable leeway in deciding to offer courses geared to the needs of a particular area.

By the time the evaluation project was being carried out, a total of 400 vocational training and educational institutions and bodies were co-operating in the Intensive Programme. In general, they are located throughout the country, although a rather significant majority are located in the populous, industrial regions where skilled manpower needs are greatest. Among them are to be found federal technical schools and organizations, private organizations and private industrial plants, State and municipal organizations and all the network of the SENAI apprenticeship schools.

In two and a half years, from January 1964 to July 1966, a total of 71,826 persons completed a course of training organized under the Intensive Programme, and at the end of this period several thousand were still undergoing training. The largest number of the Programme's graduates (about 33 per cent) had gone to SENAI schools. Approximately 26 per cent went to State and municipal organizations and about 20 per cent to private organizations.

A breakdown by type of training completed shows that approximately 50 per cent of the trainees went through courses for skilled workers; another 20 per cent completed courses for supervisors, while about 8 per cent underwent training for high-level occupations. The remaining 22 per cent graduated from a number of miscellaneous courses.

The basic plan to use all possible facilities meant that one of the basic tasks would be to locate and use idle training facilities wherever they might be - in undertakings as well as in training schools and centres. This has had both advantages and disadvantages. On the positive side, the cost has been less than would otherwise be the case, because even though the schools were paid for the use of their facilities, it was not necessary to establish special new facilities.

Organizational difficulties have inevitably arisen and have resulted in administrative problems and, sometimes, in hardships for trainees. These hardships frequently arose from the need to hold courses at odd

hours. Training in an undertaking has frequently had to take place after working hours and access to them was difficult if not impossible for those employed in other firms.

It is a Programme which has flexibility as its corner-stone. This same flexibility - embodied in the complete liberty of action given to the regional co-ordinators - is probably the most vital characteristic of the whole operation. But it has other key aspects, many of which are the natural outcome of the first:

- the speed with which the training agreements with industry and institutions were concluded and implemented;
- the way in which the Programme gained the confidence of the authorities and institutions involved, largely because it met its engagements and respected the prerogatives of both;
- its ability to steer clear of conflict with the educational system, with the networks of SENAI apprenticeship schools and with the trade unions, chiefly through raising the prestige of each by reinforcing their activities.

Even a purely superficial look at the achievements of the Intensive Programme show two very important things:

- (1) the low rate of dropout from the courses - a rate far lower than might have been expected and certainly well below that recorded by any other vocational training courses in Brazil;
- (2) a course enrolment that has exceeded all early estimates and has continued to grow steadily. At the end of June 1967 - more than 100,000 trainees had graduated from one or other of the Intensive Programme courses.

A number of factors contributed to the success of the Programme:

- the informality of its organizational and administrative structure;
- its decentralization;
- a feeling of pioneering;
- the natural leadership given by the administrative team;
- the fact that its financing was regularly assured;
- the simple accounting system instituted;
- the increasing acceptance it won from all parties concerned - public authorities, employers, trainees, educationists, etc.;

- its growing enrolment and the small number of dropouts, already referred to previously.

Some questions remained unanswered however, and were continually being raised:

- When would the employment market needs be satisfied?
- Were the courses long enough for achieving their purpose?
- Should the objectives of the Programme be kept constantly under review?
- Were the teaching materials sufficient in quantity and adequate in quality?
- Were the teachers being properly remunerated for their services?
- Was the supervision of the Programme effective?

ANNEX I-A

OUTLINE OF THE BRAZILIAN INTENSIVE PROGRAMME FOR THE
PREPARATION OF INDUSTRIAL LABOUR

The Intensive Programme, approved by Decree No. 53,324 of 18 December 1963, set out to:

- provide further training and specialized training to persons already employed in industry, as well as initial training to new industrial employees;
- ensure full utilization of training places and facilities available in schools, in SENAI and SENAC apprenticeship centres and in public and private firms providing vocational training;
- reinforce and stimulate the work of existing industrial manpower organizations - through a range of activities such as revision of manpower utilization plans, improved contacts with industry, short intensive training courses for adults;
- assist industrial firms in organizing their own training schemes and centres;
- encourage or undertake the preparation of teaching materials, including manuals, for industrial training;
- encourage co-operation among public and private institutions for the provision of basic and further training for industrial workers;
- provide initial training and further training for teaching staff and other specialists in industrial training (organization of meetings, seminars, etc.);
- carry out experimental work with and research into new forms of basic and further training - in-service training, mobile courses, correspondence courses, programmed instruction, etc.

At national level, responsibility for the Intensive Programme is vested in the Director of Industrial Education, under the immediate supervision of the Minister of Education and Culture and with support from special working groups or committees for planning, supervision and information.

At regional level, provision was made for the appointment of regional co-ordinators with specific responsibility for:

- determining regional needs and areas of priority;

- surveying training facilities available in schools and undertakings for implementation of the Programme and assessing additional requirements;
- recruiting and training Intensive Programme instructors;
- concluding with schools, firms and other organizations, individual agreements for the provision of training facilities;
- taking action to secure and distribute the teaching materials and additional equipment necessary for the Intensive Programme courses;
- where necessary, organizing courses in schools and undertakings, correspondence courses, mobile courses, study seminars, etc.;
- generally supervising the technical operation and administrative and financial organization of the Programme in their respective regions;
- awarding or countersigning certificates and diplomas;
- publicity;
- assessing the results achieved by the individual schemes and courses;
- setting up and maintaining a placement service for graduate trainees.

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- assessing the results achieved by the individual schemes and courses;
- setting up and maintaining a placement service for graduate trainees.

ANNEX II

OUTLINE OF COLUMBIA'S INSTITUTE FOR ADVANCED TRAINING ABROAD
(ICETEX)

Founded in 1950, it began operations in 1952 when it inaugurated a revolving fund for granting loans to Columbian students pursuing advanced education. The selection of students was based on individual merit. The Institute is an autonomous governmental organization whose functions are:

- primarily to promote, finance, guide and conduct high-level training and specialization for technical and scientific personnel at the principal educational centres of the world, on the basis of the country's major needs;
- provide interest-free loans on medium terms and low interest rates to students pursuing university education in the country;
- determine on a national scale present and future needs for high-level trained personnel;
- co-ordinate all available technical assistance and scholarship programmes offered by foreign nations, private or international organizations;
- advise and help in placing professional grantees trained abroad in occupational activities;
- select the educational centres best fitted to train applicants in their desired field of study;
- supervise the academic progress of Columbian students sponsored by ICETEX who are studying abroad;
- co-operate with private enterprises in developing technical programmes by sending selected personnel to foreign countries;
- comply with Columbia's international agreements for cultural inter-change of students;
- administer public and private funds for financing technical and professional education in the country;
- serve as the Secretariat of the National Committee for Scholarships;
- manage the nationally sponsored scholarship award programmes for prominent Columbian artists sent abroad for training;

- authorize foreign exchange currency to cover expenditures of Columbian students abroad;
- supervise a programme of interest-free loans awarded by commercial banks for college students.

The amount of loans granted covers travel cost, living expenses, books, tuition fees. Repayment is on a 5-year basis on return to the country.

The principles governing loan grants are:

- a total loan for persons with no economic resources;
- a partial loan for those able to pay part of the expenses;
- complementary loans for those awarded scholarships by foreign governments or organizations which do not provide for all necessary expenses.

In regard to university studies in the country, loans are repayable on a 3-5 year basis on completion of studies.

Fund-raising campaigns are carried out by which public and private companies entrust funds for specialization abroad.

Information on study opportunities abroad is collected and disseminated.

Analysis of specialized talent (in co-operation with the National Planning Office, the Public Administration School, the National Apprenticeship Service, the National Department of Statistics and other bodies).

Consists of

- present statistics on surveys of human resources of the nation;
- present and potential supply of professionals and technicians;
- actual long-range requirements of these professionals in the different economic, administrative and social sectors;
- shortages and surpluses of these occupational levels.

Statistics on

- student graduates from higher educational institutions; specialization, graduating years, ages, courses fully completed, degrees received, cost per student, per career, per specialization, percentage dropouts, etc.;
- long-term projection of university output;
- analysis of the present and potential situation of university professors;
- analysis of the need for high-level administrative personnel.

ANNEX III

DRAFT PROPOSAL FOR AN
AFRICAN SCHOLARSHIP AND FELLOWSHIP FUND

Project: An African scholarship and fellowship fund.

Purpose: The aim of this fund is to:

- (a) finance the training of Africans needed in specialized fields mainly for the implementation of regional and sub-regional but not entirely excluding national development projects (priority being given to persons already in employment);
- (b) provide support for the development and growth of "centres of excellence" among African institutions for research and training in specialized fields by financing qualified persons from other African countries wishing to train in these centres;
- (c) provide the means for financing special job-oriented, on-the-job training for Africans in African and overseas institutions and industrial establishments; and
- (d) provide the means to enable African experts to participate in study tours conducted overseas by international organizations or other bodies such as the Economic Commission for Europe, etc.

Project

justification: It is desirable that African educational institutions should play a most active role in providing specialized training particularly tailored to the development needs of African societies and that there should be a rational division of labour and programme specialization on zonal basis. Such specialized institutional facilities for training and research are virtually non-existent in Africa today.

Institutions designed to provide services to meet sub-regional or regional needs or the so-called "centres of excellence", can only survive the vicissitudes of political alliances and the corroding influence of national aggrandizement if they are not only largely international in sponsorship and accountability but multinational in staffing and programme orientation. To survive as institutions or centres serving multinational needs they have to be nursed by an assured participation of students

from the sub-region or the areas they are designed to serve. In order to help African centres of excellence to flourish, and encourage an open-door policy in admitting students and research fellows from other African countries, an independent source of supplementary financing is necessary.

Furthermore, any programme for developing specialized research and training centres in Africa, whether they be new creations or a build-up of existing facilities, must be closely integrated with programmes for the local training of African specialists. They are all inter-related elements in an integrated programme of supporting African development with research and skilled manpower.

Currently, African countries rely heavily on import of highly trained specialized manpower, particularly science and technology-based skills, for the implementation of their development programmes. Estimates of present and immediate future needs show a generally wide gap between supply and demand. The trend indicates that a higher level of skill importation will be inevitable in the years ahead. With the growing world demand for these very specialized skills which African countries require, the cost of hiring their services will continue to rise and supply will in all probability fall substantially short of import requirements. If planned programmes are now to be abandoned mid-stream, Africa must train their own nationals. But most African countries do not have the type and level of economies and institutional facilities that can endeavour to meet fully their needs of specialized manpower. The most obvious answer is for them to co-operate and train their nationals in multinational institutions.

Several industrial projects of great economic prospects are currently being put forward by the ECA for the consideration of African Governments. Assuming that the World Bank, the African Development Bank and consortia of financiers will put up billions of dollars to launch these projects, it is, however, not quite certain that the required manpower for their implementation will also be supplied by the financing bodies. They may not. Some skilled manpower will be hired and obtained from abroad but the more experienced and most effective foreign personnel may not be available at any price. Mid-stream, some projects may be abandoned and others may not get started simply for lack of executive capacity. Experience of past development efforts now makes

it mandatory that once feasibility studies justify particular projects, nationals should be put into the training pipeline as early as possible even at the time of searching for factory sites and finance so that trained national personnel will be available right from the first day the project goes into production.

For projects designed to serve sub-regional economic communities it is not clear who should train African personnel for them - the host country or neighbouring countries which may be jealous of the location. The initial training of Africans for these projects ought to be undertaken by the same organization whose ideas gave birth to sub-regional development projects, more so, to maintain and nurture the spirit of intra-African co-operation. The financing of such training is most appropriate for a neutral fund and organizations concerned with industrial promotion.

Training should be designed to meet particular requirements of development projects. Where funds are available, African countries can thus have their nationals trained at home and in African environments, although they would also continue to make use of opportunities overseas, requesting friendly countries to organize tailored-to-need training programmes for their nationals.

The programme:

- (a) Training of African specialists and research fellows in the technical, professional and managerial fields. Subject to availability of resources a target of 400 trainees over an initial five-year period is proposed. The duration of training should range from six to twelve months. In certain cases programmes of up to two full academic years may be necessary. Priority should be given to training persons already in employment.
- (b) Development of an African research corps in the fields of technological science, industry and agriculture.

Sponsorship:

Possibly the Special Fund, the foundations, ECA and bilateral donors. Some African countries may be able to contribute institutional facilities and scholarships for other African nationals. Interested specialized agencies within the United Nations family of Organizations could be invited to provide fellowships under the programme.

Administration: As it is desirable that the administration of the scheme should be in the hands of an authority external to the African Governments but which is closely attached to the development plans of the continent and receiving total acceptance of the States as being disinterestedly concerned with their accelerated growth and progress, the Executive Secretary of ECA is proposed as Programme Director. An international organization, such as the Special Fund, providing the bulk of the fund could appoint the Chief Programme Officer and an Assistant Programme Officer. Private foundations or bilateral sources could render consultative services while the ILO and UNESCO may be requested to provide technical advice on the content of training programmes and their adaptation. The ECA could provide host and secretarial facilities including a Programme Officer.

It is anticipated that the administration of the proposed programme would require the following personnel and facilities:

1 Chief Programme Officer	.	6 man/years ...
1 Programme Officer	.	6 man/years ECA
1 Assistant Programme Officer	.	6 man/years ECA
1 Bilingual Secretary	.	6 man/years ECA
1 Stenographer	.	6 man/years ECA

Physical facilities:

3 office rooms
office equipment
(typewriters, desks, filing cabinets, stationery, etc.).

Evaluation study: A consultant for 4 man/months to evaluate the potentials of a number of African universities to participate in the programme, take soundings of possible co-operation by African Governments and other organizations and formulate details of an operational programme.

Operation dates: The programme could start operation by 1970 if funds can be assured and administrative arrangements completed and should run for six years in the first instance.

ANNEX III-A

PROPOSAL FOR AN AFRICAN FELLOWSHIP/SCHOLARSHIP SCHEME 1970-74

1. Target: 400 awards over five years in fields critical for multi-national and national industrial development programmes; 60 per cent of awards for 6 to 12 months' on-the-job industrial training attachment and 40 per cent for 12 to 18 months' post-graduate training.

2. Estimated costs:

Travel: 2 single trips:	US\$ 900
Subsistence, books, etc.:	US\$2,400 per annum ^{1/}
	(in US\$)
Travel fares (\$900 x 400)	360,000
Subsistence, books, etc., over 6 years:	
(A) 6-12 months (9 months average) x 240	576,000
(B) 1-2 years (18 months average) x 160	896,000
Total	<u>1,832,000^{2/}</u>

Annual average costs: US\$305,400

3. Programme phasing

Year	Number of grants		
	9 months	21 months	Total
1970	40	25	65
1971	45	35	80
1972	50	45	95
1973	55	55	110
1974	50	-	50
	240	160	400

- ^{1/} It is envisaged that employed trainees under the programme would be entitled to their normal wages and salaries to enable them to maintain their families and dependants. Subsistence allowance under the programme would normally vary according to the place of study.
- ^{2/} Estimate does not include administrative costs.

<u>Distribution by fields</u> (indicative)	<u>Target</u>	<u>Distribution by fields</u> (indicative)	<u>Target</u>
Economic Integration	15	Canning Technology	15
Industrial Engineering	15	Rubber Technology	15
Mechanical Engineering	10	Textile Technology	15
Chemical Engineering	15	Toolmaking Technology	10
Metallurgical Engineering	20	Timber Technology	10
Petroleum and Gas Engineering	15	Foundry Technology	15
Electronics Engineering	15	Fuel Technology	15
Production Engineering	20	Glass and Ceramics Technology	10
Industrial Designing	10	Industrial Medicine	10
Biochemistry and Chemistry	10	Industrial Management	15
Food Processing Technology	15	Other fields (25 per cent)	<u>100</u>
Leather Technology	10		<u>400</u>