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MANPOWER ASPECTS OF INSTITUTIONAL INFRASTRUCTURE FOR
INDUSTRIAL DEVELOPMENT, WITH SPECIAL REFERENCE TO
AFRICAN LEAST DEVELOPED COUNTRIES*

by

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I. Introduction

As stated in the provisional agenda for the meeting "skilled manpower is the primary ingredient of any industrial success". It is equally true to state that the effectiveness of any institutional infrastructure and related services for promoting industrial development very much depends upon the skill, attitude, sense of commitment and general disposition of the person who operates or administers the institutional arrangements for achieving declared goals and set targets. The type, quality and quantity of manpower required will also depend upon the nature of functions and services to be executed and on the organizational arrangements and procedures for discharging these functions and services. Various types of institutional structures and organizational arrangements are needed for different types and levels of industrial promotion activities. All these factors influence the environment in which industrial promotion functions and services have to be carried out and, consequently, the amount, level and type of trained manpower required.

In this paper an attempt will be made to outline various types of institutional infrastructure that developing countries would wish or ought to develop or are already developing in order to accelerate the process of industrialization. On this basis the paper will also try to give broad categories and types of manpower required for the operation of industrial development institutions, the personnel problems involved and the need for manpower planning and training programming in order to ensure that there is adequate executive capability to administer established institutions. The next section of the paper looks at manpower supply situation

in Africa's least developed countries and their limited capacity to supply locally the required technical, professional and managerial manpower for desired industrial development programmes. Different levels of training institutions are reviewed for their manpower supply capability and other industrial promotion role. In the concluding section attention will be drawn to some manpower training issues and the need for collective self-reliance in any bid to become self-supporting in manpower resources in the foreseeable future.

In a situation where modern industrial processes and related technological know-how are not traditional to African economies, much effort has to be made to foster industrial development. It is for this reason that developing countries have adopted various legislative, administrative and institutional measures specially designed to promote industrialization. These measures range from simple provisions to complex administrative arrangements and the establishment of research, financial, investment and other institutions. What prevails in a given country depends very much on a number of factors, including the priority accorded to industrialisation; the financial and manpower resources to run specialized research and training institutions; and existing administrative capability for the formulation and review of industrial policy, for monitoring the implementation of declared goals and targets and supervising and ensuring the effective implementation of industrial promotion services and facilities.

No one developing African country can have, finance and operate all the institutional facilities that are desirable or needed to promote the industrial transformation of predominantly agrarian and raw materials producing economies of the types that prevail in Africa's least developed countries. This notwithstanding, it is necessary to outline a variety of institutional facilities which form the complex institutional infrastructure for bringing about accelerated industrialisation. Such listing not only provides a check-list for countries to appreciate what still needs to be done, but also to visualize the variety and levels of specialised trained manpower that would need to be mobilized in order to effectively operate such institutions as and when they are established.

For simplicity in presentation institutional framework for industrialisation will be grouped functionally, that is, grouping separately institutions that are primarily concerned with policy formulation, planning, regulations and the provision of incentives and facilities; institutions for the allocation of resources; and institutions for manpower development. These groupings are not exclusive of other services and one institution may operate one or more primary functions and several other subsidiary functions and services.

Types of Institutions Concerned with Promoting Industrial Development

<u>Functional Group</u>	<u>Institutions</u>	<u>Typical Functions</u>	
(1) Policy, planning and incentives dispensing agencies	Government Ministries:	Principal responsibility for industrial development policy, planning and regulation; designing industrial incentives.	
	- Industry		
	- Finance		Providing tax incentives to encourage private investment; regulating the operation of financial institutions.
	- Economic Development and Planning		Overall development planning; determining priorities and strategy; sectoral industrial planning in collaboration with Ministry of Industry.
	- Trade	Developing market outlets, both internal and external for products of industries; industrial components in trade agreements.	

<u>Functional Group</u>	<u>Institutions</u>	<u>Typical Functions</u>
	- Education	Formulating overall educational policy and developing institutional facilities that take into account the manpower and vocational skill requirements of industries.
	- Manpower or Labour	Formulating overall policy for manpower development and utilization; allocation of expatriate quotas; utilization of national and foreign scholarships; coordination of training; (A good example is set by Tanzania).
	- Science and Technology	Promoting the development, acquisition and application of industrial and other technologies and encouraging training in this field. Normally only the relatively more advanced developing countries (India, Egypt, Korea) have been able to afford this structure.
(ii) Resources Allocation	Industrial Development Banks; Finance Corporations.	Providing long-term investment loans; undertaking feasibility studies in order to stimulate indigenous private investments.
	Agencies for natural resources: Industrial Estates Electricity Corporations Water Boards Industrial Cooperatives.	These institutions are concerned with access to vital industrial natural resources and their adequate supply to industries at reasonable prices.

<u>Functional Group</u>	<u>Institutions</u>	<u>Typical Functions</u>
(iii) Services	Specialized departments in ministries and research institutions providing extension services; Industrial Consultancy Groups. Industrial Statistics Office. Federation of Industries, Chambers of Industries.	Providing information, technical data and consultancy services related to production and marketing etc., usually free to industrial enterprises. Collection and dissemination of industrial statistics. Associations of industrialists and businessmen for collective bargaining and for rendering services to its members.
iv) Research and Development	Research Institutions: - Industrial Research Institutes - Industrial Research Councils - National Councils for Science and Technology - Institutes for Industrial Design and Production - Academy of Science.	Concerned with research into raw materials use, adaptation and development of new production processes and of machinery; providing information on research findings; consultancy services to government and industries.
v) Manpower Development	Training Institutions: - Universities - Polytechnics - Colleges of Technology - Technical Institutes - Trade Schools - Training workshops. National Training Boards and Training Funds.	Providing training for industries at different levels and for various functions; research and consultancy work. Promoting and funding training for industries.

<u>Functional Group</u>	<u>Institutions</u>	<u>Typical Functions</u>
(vi) Regulatory Agencies	National Standards Councils or Organizations.	Ensuring quality and promoting the production and trade in standard components.
	Patents Offices.	Registration of patents and quality control.
	Price Control Boards.	Fixing sales prices for industrial products on a selective basis.
	Professional bodies: - Trade Unions. - Professional Associations.	Collective bargaining and maintenance of professional standards and ethics.

The foregoing listing of institutions for stimulating industrial development is neither exhaustive nor representative of the experience of any one developing country. It is simply to enhance our appreciation of the institutional infrastructure necessary for pursuing a sound industrial development policy. From the listing, it is obvious that while the Ministry of Industry remains the government lead agency for promoting vigorous industrial development policy, refining strategies and mobilizing resources for the attainment of industrial development goals and production targets, other government ministries have a complementary role to play. Similarly, several research and training institutions make major contributions both in solving production and marketing problems and in producing the skills and technical and managerial personnel for manning various services and institutional facilities that facilitate industrial processes. Even industry itself through its training workshops in factories, associations of manufacturers and of exporters as well as through other cooperative arrangements provide services for their members. Some of the required institutions can be sustained only when the level of economic development justifies their establishment. For example, Japan has developed specialized departments for the "basic industries" and for "consumer goods industries" and has established an "Agency for Natural Resources" with principal responsibility for dealing with the needs of industries with respect to hydro-electric power and gas.

II. Manpower Requirements of Industrial Promotion Institutions

For the efficient operation of any of the institutional infrastructure for promoting industrial development trained manpower is needed at various levels and in different skill-mix. Such will depend upon the nature of functions, types of services and organizational set-up. The general requirements, scientists, administrators, managers, economists, statisticians and econometricians, industrial relations experts, investment and banking experts, chemists, lawyers, accountants and book-keepers, technicians, skilled workers, and many more specializations and skills will be needed. For manpower planning and training purposes these varieties of skills and experience may be grouped into different categories as follows:

- (i) Direction and control: Personnel requiring extensive experience and training in the particular industry; with administrative and managerial capability; ability to lead and work through people and to set clear goals and ways of attaining them; he will normally be a university graduate and should preferably have had some exposure to industries or practical experience. It is people of these qualities who would normally be given the responsibility to develop and run particular institutional facilities and services for industrial development.
- (ii) Planning and policy formulation and review: Personnel with professional training in various disciplines according to functions; analytical capability and ability to review, evaluate and formulate industrial development policies and strategies and to stipulate priorities and goals. Usually a university graduate or equivalent in the professional, technical or social-sciences fields.
- (iii) Executing: Personnel to translate policies into concrete projects; elaborate and disperse incentive schemes; supervise field services and extension workers; their operations determine the effectiveness of institutional infrastructure for industrial development; usually graduates of polytechnics, high schools and sometimes universities.
- (iv) Supporting services: Personnel in the accounting, clerical, secretarial and junior administrative grades; they carry out routine details and

semi-skilled work; have more frequent contacts with clients for whom institutions are designed to facilitate their industrial development efforts; generally secondary and middle school graduates.

All levels of personnel in the various institutions of industrial development institutions are of critical importance since their operations are invariably interdependent. If any level can be claimed to have an edge over the other in relative importance, it is the executive and supporting staff levels. This is because they carry out decisions; they are at the level of rendering services to clients; they are in direct contact with the public and the clientele to be helped. Their performance, sense of responsibility and attitude to work determine how effective an incentive or service scheme could be. To illustrate this point an industrialist who has to wait for two hours for his application to be traced in the registry or whose file cannot be traced by a file messenger or who got put off by a Chief Clerk, would certainly be reluctant to come again to the ministry to seek incentives and investment opportunities.

The manning of various industrial institutions pose a number of personnel problems. Take for instance the staffing of the Ministry of Industry which has the task of not only formulating industrial development policy and the strategy for realizing it, but also that of establishing and supervising the operations of specialized industrial promotion institutions such as industrial research institutes, industrial estates, industrial consultancy services etc. Too often the ministry fails to spell out in clear detail what the main goals are that it must fulfill and the alternative ways of achieving these goals. Tasks to be performed are not always precise and individual officer's job descriptions are rare. Its staff resources tend to be largely made up of generalists and administrators who come and go too frequently. Prominent among the personnel problems facing it are those relating to the recruitment, utilization and retention of its professional staff. The practice of making the administrative class dominate the upper echelons in policy-making and executive direction of the ministry has not contributed to the growth of professionalism in its staff resources and use. This requirement is considered in relation to the need for results-oriented services that are adequately manned by well-trained men and women who are motivated by a professional desire to render their services in an effective and professional manner.

Creating a professional cadre of service-oriented and professionally dedicated personnel is one way of fostering an attitude of service in the men and women who operate institutions designed to guide, encourage and assist industrial entrepreneurs. Adequate remuneration and opportunity for advancement is assumed if industrial professionals are to find it worthwhile to remain on their jobs.

Internal manpower planning and staff development through on-the-job training, orientation courses, delegation of responsibility and other arrangements are important for the effective operation of institutions for promoting industrial development. Having defined in clear terms the specific functions of an institution is to fulfill and the targets to be reached, it should be easy to establish job descriptions and determine the type and level of personnel to carry out the functions. Both the recruitment of staff for new posts and the further training of existing staff require programming over given time spans. It is important that staff with the requisite training and experience that match the job to be done should be recruited for the staffing of industrial development institutions. These institutions should be regarded as specialized services that should be staffed by personnel with the right skills. It is certainly not the proper place to provide "jobs for the boys". In the same spirit internal training and reorientation should receive special emphasis and appropriately programmed, if existing staff is to update knowledge, acquire new techniques and get exposed to the development experiences of other countries.

In this section the manpower needs of institutions for promoting industrial development has been generalized without specific reference to a given institution in a given country. Attention has been drawn to the fact that a variety of trained manpower is required and different levels of training and experience are needed according to the type of functions to be rendered, the organizational set-up and the level of responsibility delegated to the concerned officer. Since technical, managerial and other high-level manpower is expensive, the relative mix between this category of personnel and the lower level personnel has to be determined by the level of resources at the disposal of the institution and by other considerations. It should be stressed however, that having regard to cost consideration it is certainly more productive to have a few well staffed industrial

development institutions than to have an array of institutions that are ineffective simply because they are understaffed and are allowed to operate with unqualified, underpaid and ill-motivated staff resources. It is not enough to have only the top echelons well trained and dedicated to service. All levels need relevant training and should have as their major asset a sense of service to their clients.

III. Manpower Supply in Africa's Least Developed Countries

In this section manpower supply will be considered in relation to local potentials to supply and train manpower required for the strengthening and effective operation of existing industrial institutions, including the ministries of industries, and to meet the requirements of any new institutions that may be planned in the near future. Three aspects will be examined: the capacity to supply qualified manpower in the quantity, variety and skill-mix required; the existing trained manpower supply/demand gap; and the issue of quality gap.

(1) Capacity to supply required manpower

The capacity of African least developed countries to supply trained manpower for the effective operation of required institutions designed to accelerate industrial development in their areas, including the requirements of manpower training institutions themselves, may be appreciated by looking at the size of individual country population; existing institutional facilities for the training of personnel; and current school enrolment data as an index of future supply capacity for qualified manpower.

T A B L E I
Population of African Least Developed Countries around 1975

Total population in 1975 by sex and country (Unit: thousands)				5-24 years age groups by sex and country		
Country	Male	Female	Total	Male	Female	Total
Benin	1,514	1,560	3,074	690	701	1,391
Botswana	320	371	691	162	173	335
Burundi	1,859	1,906	3,765	825	830	1,655
Central Africa Empire	861	929	1,790	392	403	795
Chad	1,925	2,098	4,023	863	918	1,781
Ethiopia	14,111	13,864	27,975	6,371	5,924	12,365
Gambia	256	253	509	109	109	218
Guinea	2,187	2,228	4,415	961	977	1,938
Lesotho	566	582	1,148	234	237	471
Malawi	2,341	2,576	4,917	1,086	1,123	2,209
Mali	2,834	2,863	5,697	1,271	1,255	2,526
Niger	2,282	2,309	4,591	1,038	1,041	2,079
Rwanda	2,024	2,176	4,200	917	976	1,895
Somalia	1,567	1,603	3,170	754	761	1,515
Sudan	9,229	9,039	18,268	4,269	4,137	8,406
Tanzania	7,577	7,861	15,438	3,658	3,510	7,168
Uganda	5,692	5,661	11,353	2,593	2,529	5,122
Upper Volta	3,003	3,025	6,028	2,743	2,310	5,053
TOTAL	60,148	60,908	121,056	27,536	26,994	54,530

Source: Population by sex and age for regions and countries 1950 - 2000 as assessed in 1973. Medium Variant - Prepared by United Nations Population Division.

Of the 18 countries currently making up Africa's LDCs, only four, namely Ethiopia, Sudan, Tanzania and Uganda, have total population exceeding 10 million; 11 countries have less than 5 million inhabitants each and 2 with much less than a million each. The absolute size of a country's population influences the number of nationals in the 5-24 years school age population and, consequently, the local potentials for the production of trainable nationals, assuming that there are adequate physical facilities and financial resources, as well as socio-political will to enable all to go to school. The result is that for many of the countries under-population, relative to land and natural resource endowment and the requirement for development, has been a major constraint in their capacity to train enough nationals to run their services, including institutional infrastructure for industrial development.

Population constraint is particularly strong in the case of Botswana, The Gambia and Lesotho where the total school age-group, 5-24 years, is much less than half-a-million each. The same population factor limits market size and the capacity of the government to derive substantial revenue through taxes on imports and, consequently, the capacity of the national income to sustain much needed educational and training facilities. Qualitatively, it does not necessarily follow that countries with larger population invariably produce more and better quality trainable manpower since the income regularly at the disposal of the government and the relative priority given to education and training may result in less populous countries being relatively better off in trained manpower resources.

In this evaluation no account has been taken of the beneficial effect technical cooperation personnel and immigration could have on countries with small population but relatively more substantial technical cooperation experts or intra-African seasonal migration of personnel.

T A B L E 2

Educational and Training Facilities in African Least Developed Countries around 1975/76

Country	University	Enrollment	Polytechnics & Techn. Colleges	Enrollment	Public Administration & Management Development	Enrollment
Benin	na	na	School of Nursing	200		
Botswana	The University of Botswana, Lesotho and Swaziland	200 (Teachers=22)	Potswana Agricultural College	200	Botswana Enterprises Development Unit	33
Burundi	Université de Burundi	600 (Teachers=22)	<p>École Technique</p> <p>Centre Social et Educatif (C.S.E.)</p>	150 15		
Central Africa Empire	Université Jean Bédel Bokassa	400 (Teachers=84)	<p>1/ Attached institutions to the University are:</p> <ul style="list-style-type: none"> - Institut Universitaire Technologique de Mines et de Géologie - Institut Universitaire de Technologie Agronomique - Institut de Recherche pour l'Enseignement des Mathématiques <p>2/ Collèges</p> <p>École Centrale d'Agriculture</p> <p>École Nationale des Arts</p> <p>École Territoriale d'Agriculture</p>	n.a. n.a. n.a.		

Country	University	Enrolment	Polytechnics & Tech. Colleges	Enrolment	Public Administration & Management Development	Enrolment
Chad	Université du Tchad	600 (Teachers=55)	Ecole Nationale des Télécommunications	n.a.	Ecole Nationale d'Administration	n.a.
Ethiopia	National University University of Asmara	4,978 (Teachers=650) 800 (Teachers=80)	Polytechnic Institute Jimma Agricultural Institute Asmara Community Development Training and Demonstration Centre	370 156 (Teachers=23) 220 (Teachers=16)		
Gambia	Brikama Post-Secondary College	n.a.				
Guinea			Institut Polytechnique de Conakry Ecole Nationale des Arts et Métiers	120 n.a.	Ecole Supérieure d'Administration	n.a.
Lesotho	National University of Lesotho	500	Lesotho Technical Institute Maseru Agricultural Training School	199 n.a.	The Lesotho Institute of Public Administration	n.a.
Malawi	University of Malawi Soche Hill Teachers Training College	1,147 (Teachers=133) n.a.	Bunde College of Agriculture Colby College of Agriculture	234 150	Chancellor College Idlongo Land Development Training Centre	o. 550

Country	University	Enrolment	Polytechnics & Tech. Colleges	Enrolment	Public Administration & Management Development	Enrolment
Malawi			Land Husbandry Training Centre Malawi College of Forestry Mikolongwe Veterinary Training School The Polytechnic Tmshila Farm Institute	100 186 50 n.a. n.a.		
Mali	n.a.	n.a.	Ecole Nationale d'Ingénieurs Ecole de Médecine et de Dentisteries Ecole Normale Supérieure Institut Polytechnique Rural	n.a. n.a. n.a. n.a.	Ecole Nationale d'Administration	n.a.
Niger	Université de Niamey	224 (Teachers=53)			Ecole Nationale d'Administration du Niger	403 (pre-service) 308 (in-service)
Rwanda	Université Nationale du Rwanda	525 (Teachers=60)	Ecole Technique Officielle Don Bosco Ecole Supérieur des Sciences Infirmières	n.a. 40		
Somalia	National University of Somalia	790 (Teachers=20)	Ecole Industrielle School of Public Health School of SeamanSHIP and Fishing Technical College Veterinary College	n.a. 170 30 (Teachers=10)		

Country	University	Enrolment	Polytechnics & Tech. Colleges	Enrolment	Public Administration & Management Development	Enrolment
Sudan	The University of Khartoum Cairo University Khartoum Branch	6,425 (Teachers=870) 5,000 (Teachers=80)	Higher Technical Teachers Training Institute Higher Institute of Surveying Higher Institute of Commercial and Financial Studies College of Fine and Applied Art Institute of Secretarial Studies Institute of Survey Technicians Khartoum Nursing College Forest Rangers College Institute of Civil Engineering & Architectural Technicians Institute of Textile Engineering Technicians Institute of Laboratory Technology Institute of Mechanical & Electrical Engineering Institute of Mechanical Engineering Institute of Radiography and Radio Therapy School of Hygiene	n.a. n.a. n.a. 180 (Teachers=30) n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a. n.a.		

Country	University	Enrolment	Polytechnics & Tech. Colleges	Enrolment	Public Administration & Management Development	Enrolment
Tanzania	University of Dar-es-Salaam (1) College of National Education College of Business Education	2,346 (Teachers=325) 121 600 (part time)	ARMI Institute Dar-es-Salaam College of National Education Dar-es-Salaam Technical College Kunduchi Fisheries Institute Ministry of Agriculture Veterinary Training Institute Water Resources Institute (Other agricultural Institute) Butimba College of National Education Ilonge Institute Ukiriguru Institute Mtwara Institute Tumbi Institute Nyegezi Institute Uyole Institute Tengert Institute Mlingano Institute Klerum College of Education Lyamungu Institute Mpeapwa Institute Mkata Institute (1) Forestry Training Institute Mbagani Fisheries Development Centre	271 200 840 20 260 n.a. 80 125 80 40 150 250 40 50 n.a. 20 80 110 150 25	Kivukoni College African College of Wildlife Management Co-operative College Institute of Development Management, Mzumbe Institute of Finance Management Lushoto Integrated Development Project Mlingano Institute (Farm Management) Mkata Institute (Also Range Management) Lushoto Integrated Development Project (Rural Development) University of Dar-es-Salaam (also development policy)	150 100 300 400 400 20 50 (included in 1) (included in 1)

Country	University	Enrolment	Polytechnics & Tech. Colleges	Enrolment	Public Administration & Management Development	Enrolment
Uganda	Makerere University	3,666 (Teachers-337)	Apal Agricultural College	210	Institute of Public Administration	0.190
	Centre for Continuing Education	n.a.	Bukalasa Agricultural College	249		
	Institute of Statistics and Applied Economics	n.a.	Busitema National College of Agricultural Mechanization	350		
			Uganda Technical College	536 (full time) 150 (part time)		
			Fisheries Training Institute	116		
			National Teachers College, Kyambogo	450		
			Nkumba College of Commerce & Advanced Studies	600		
			Nyabyeya Forestry College	160		
			Uganda College of Commerce	570		
			Uganda Co-operative College, Kigumba	50		
			Uganda Technical College	536		
			Veterinary Training Institute	165		
	Upper Volta	Université de Ouagadougou	450	Constituent Institute des: - Institut Universitaire de Technologie - Institut supérieur Polytechnique	n.a. n.a.	Centre d'Etudes Economiques & Sociales d'Afrique Occidentale

SOURCE: For all Commonwealth countries. 1/Education and Training Resources in the Developing countries of the Commonwealth, Oct. 1977.
 2/ Training for Agricultural Development, Directory of Resources in the Commonwealth, 1976 by the Commonwealth Secretariat.
 For all others: The World of Learning 1975-1976.

Table 2 lists institutional facilities at post-secondary school level for the training of middle and higher-level personnel in African Least Developed Countries. For practical reasons and want of data, no account has been taken of many specialized training institutions under the aegis of government ministries and departments. The listing does not include institutional facilities for vocational skill training in a variety of important skill areas. Even for the institutions covered, data are not available for some countries and where information and data have been supplied these are at least three years behind what is currently prevailing. Notwithstanding these limitations, the table shows the limited infrastructural base for manpower training in most African LDCs and, therefore, testifies to their experience in finding it really difficult to establish and operate essential institutional infrastructure for promoting industrial development.

The four countries that have fairly sizeable numbers of students and teachers in their post-secondary educational institutions are Sudan, Ethiopia, Uganda and Tanzania. These are the same four countries with population of over 10 million inhabitants each. It is revealing to compare university enrolment with enrolment in polytechnics, colleges of technology and management institutions. In most, if not all of the African LDCs, university enrolment for the production of high-level manpower towered over enrolment in middle-level and technician training institutions. The Ethiopian and Ugandan data, for example, bear testimony to the old practice of regarding university trained manpower as more important than the production of skilled manpower for executive functions at the grass-root level.

Specialised post-secondary institutions are scarce in African LDCs, more so in respect of training in the industrial field than in agriculture and commerce. In this regard it is of interest to note the existence of the Ecole Industrielle of the National University of Somalia, the Institut Universitaire Technologique de Mines et de Geologie in Burundi and the Institut Universitaire de Technologie in Upper Volta.

The overall impression one gets from Table 2 is that most African LDCs have very limited institutional facilities for the local training of the manpower they need and as a result they have had to rely heavily on external facilities for training their nationals in many specialized technical and managerial fields or rely on technical cooperation arrangements for the supply of scarce manpower. In either way there is both natural, institutional and financial constraints on their ability to produce nationals for the effective operation of many of the desirable institutional facilities for stimulating industrial growth.

Educational Enrollment in African Least Developed Countries Around 1975

COUNTRY	EDUCATION										TOTAL	TEACHERS	TEACHING STAFF	TOTAL					
	1st level	2nd level	General	Vocational	Teacher Training	3rd level	1st level	2nd level	General	Vocational					Teacher Training	3rd level			
ALGERIA	401,521	16,711	14,403	1,208	1,100	1,148	142,182	212,953	279,673	221,412	1,169,279	859,831	197,706	973,604	1,954,443	116,293	221,922	125,597	24,617
ANGOLA	12,046	8,704	1,790	1,208	1,100	1,148	14,462	15,968	47,429	23,895	281,839	190,922	28,857	55,296	63,187	14,266	16,462	13,774	6,618
ARGENTINA	1,790	1,208	1,100	1,100	1,100	1,100	13,621	15,254	45,572	21,509	268,120	182,263	26,611	45,876	53,257	12,098	15,611	7,143	6,175
AUSTRALIA	1,790	1,208	1,100	1,100	1,100	1,100	233	714	1,687	1,771	8,996	5,533	1,824	3,296	1,100	1,699	547	1,209	329
BELGIUM	1,108	1,148	1,148	1,148	1,148	1,148	608	547	170	615	4,723	3,126	422	6,896	9,930	489	304	5,381	111
BENIN	1,108	1,148	1,148	1,148	1,148	1,148	541	547	2,118	555	21,342	6,474	2,040	5,474	3,064	465	(500)	1,002	-
BURUNDI	8,022	752	748	1,300	94	150	3,617	2,512	5,786	3,349	31,699	18,646	3,481	28,681	39,245	3,509	4,226	4,209	948
CAMEROON	1,790	1,208	1,100	1,100	1,100	1,100	637	(700)	1,509	(712)	13,166	6,929	1,372	2,599	3,218	860	740	835	347
CHAD	1,790	1,208	1,100	1,100	1,100	1,100	971	500	1,349	515	12,097	6,181	1,161	1,994	2,606	570	605	326	304
COMOROS	1,790	1,208	1,100	1,100	1,100	1,100	25	500	150	(150)	649	554	187	275	500	242	66	111	30
COTE D'IVOIRE	1,790	1,208	1,100	1,100	1,100	1,100	41	500	10	47	420	194	24	330	612	48	69	398	13
GUINEA	1,790	1,208	1,100	1,100	1,100	1,100	74	(85)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
INDONESIA	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
KENYA	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
LIBERIA	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
LIBYIA	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
MADAGASCAR	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
MALI	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
MALTA	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
MOROCCO	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
NETHERLANDS	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
NETHERLANDS ANTILLES	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
NEW ZEALAND	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
NIGERIA	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
RUSSIA	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
SENEGAL	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
SIERRA LEONE	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
SOMALIA	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
SWEDEN	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
SWITZERLAND	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
TANZANIA	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
TUNISIA	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
ZAMBIA	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-
ZIMBABWE	1,790	1,208	1,100	1,100	1,100	1,100	166	(300)	153	85	1,420	434	304	617	(345)	56	(75)	223	-

SOURCES: UNESCO Listing 23 March 1978 ; data tabulated by ICA Statistics Division.

1/ Data for Ethiopia - 1973
() estimates

In Table 3 data are presented on school enrolment by level and type of education around 1975. Accepting the fact that education at the second level (secondary general, technical and vocational) is the main source for the supply of lower level trained manpower and the main source of intake for third level education, two striking features may be observed. The first is the ratio of total enrolment at the second level to that of the first level. The ratio varies widely among the countries, ranging from as low as 3% in Rwanda, 10% in Nigeria, 20% in Mali, 22% in Ethiopia and 24% in Sudan. The other feature is enrolment at the second level for different types of education, especially the ratio between general and technically vocational courses.

Table 3 reinforces the earlier impression derived from Table 2. While educational and training facilities are limited in African LICs, school enrolment indicates that not all eligible school-age population are going to school or find facilities to do so, especially at the second level. There is also gross imbalance in the distribution and use of available places in second level institutions. This is particularly significant since this is the level that produces the skilled hands at the routine executive level. It is largely due to the imbalance in the utilization of facilities at the second level, accentuated by social values set on different types of jobs and qualifications and perpetuated by colonial premium on clerical work, that African LICs, like other African countries, experience recurrent shortages of well trained lower-level technical personnel and skilled operatives needed in industries, agriculture and other sectors.

Decrease educational and institutional facilities cannot provide enough places for all who are willing to learn, and because curricula structure and course offerings still cling to inherited patterns, notwithstanding far-reaching educational reform in Tanzania, Ethiopia etc. over the past two decades, the countries find themselves faced with manpower shortages as their economies grow. Periodically new investment opportunities emerge with the adoption of new socio-economic development plans. At the implementation stage the recurrent problem which has been difficult to solve in one country after the other has been that of executive capacity - technical and managerial skills to programme implementation, execute projects, follow up on implementation and evaluate results and impact. It also includes capability in financial mobilization and budgetary management and technical skills to carry out project identification, formulation and appraisal.

T A B L E 4

Manpower Demand/Supply Balance Sheet for
Selected African Least Developed Countries

(1) TANZANIA (1969/70-1973/74)

<u>ISCO</u> <u>OCCUPATION</u> <u>CATEGORIES</u>	<u>TOTAL</u> <u>EMPLOYMENT</u>	<u>NON-</u> <u>CITIZENS</u>	<u>REQUIREMENT</u>	<u>SUPPLY</u>	<u>SHORTFALL</u>
A	4,076	1,403	3,793	2,727	- 1,060
B	10,943	2,146	12,333	9,706	- 2,627
C	29,943	3,597	13,109	NA	NA
D	4,681	260	1,876	"	"

Source: Manpower Planning Division: Survey of High and Middle Level Manpower
Requirements and Resources. Vol. IV, Dar-es-Salaam 1969.

Table 4 (continued)

(ii) UGANDA (1961-71)

	Requirement	Supply	Short/ Surplus	%
Higher Technicians	525	353	- 172	-33
Middle Technicians	2,457	1,917	- 540	-22
Lower Technicians	3,457	2,272	- 1,185	-35
Other skilled and educated	6,078	4,349	- 1,729	-28

SOURCE: Ministry of Planning and Economic Dev. High Level Manpower Survey. Entebbe, Uganda, 1967.

Table 4 (continued)

(iii) SOMALIA (1975-1978)

	Demand	Supply	Shortfall	%
Administrative	1,382	505	877	63.4
Professional	1,735	1,162	573	33.0
Higher Technicians	3,928	626	3,302	84.1
Lower Technicians	4,296	3,982	314	3.3
Skilled Labour	10,089	879	9,229	91.5
Total	21,410	7,135	14,295	66.7

SOURCE: General Directorate of Planning and Coordination: Manpower Requirement (1975-78) Vol. II. Mogadishu 1975.

Table 4 (continued)

1961-62 - 1970/71

ISCO Occupation Categories	Demand	Supply	Short/Surplus
A	7,250	6,465	- 785
B	14	14	0
C	39,300	12,738	-26,562
Total	46,600	19,217	-27,383

Table 4 (continued)

ETHIOPIA (1968-72)

ISCO Occupation Categories	Demand	Supply	Short/Surplus
A	7,131	3,640	- 3,491
B	6,515	4,232	NA
C	79,499	NA	NA
Total	93,145	NA	NA

In terms of balance between manpower demand and manpower supply the usual gap has frequently appeared as shortage at a particular level and surplus supply of the semi-skilled and unskilled labour resources. These characteristics are illustrated in Table 4. In terms of sheer numbers and the relative importance of different levels of manpower in production and distribution systems, including the provision of services to stimulate industrialization, the experience of many African countries shows that the real manpower bottleneck has been and for some time will continue to be that of middle-level manpower.

The third aspect of the manpower supply problem is that of quality. Africanization has extended from the public services to the administrative and academic staff of all levels of the educational and training systems, albeit, at varying degrees of Africanization. The content of education and curricula have been revised substantially to relate to the socio-economic goals of each country. Even languages of instruction have changed with Arabic and Swahili gaining in ascendancy in some countries. The most far-reaching educational reform has taken place in Tanzania and under the Ujamaa villages the school at the first and second levels has become the centre of community life and education and work are no longer divorced. In these changes transitional problems have become inevitable and have resulted in falling standards, although educational relevance has enhanced.

Falling standards in teaching and learning processes have resulted in the products of the school system not being able to cope effectively with the development problems confronting them. There is no doubt that the nature of these problems are much more complex today than they were on the eve of independence and that the pressure on the integrity of public officials in charge of incentives and services are more severe today than they were in colonial days.

Basically, curricula structure at the university level is still traditional in subject structure and course offerings. Many skill areas and specialized disciplines that are critical to the exploitation and development of natural resource endowment, for modernizing agriculture and for revolutionizing industries are hardly to be found in local universities and other institutions. Where some of these subjects and courses are taught at all the tendency has been to give premium to academic excellence rather than developing practical ability to perform. This has led to recurrent complaints by the business community against African educational systems for failing to give sufficient attention to the practical problems of the world of work.

courses and programmes for industries. Universities also need to give more attention to skill and knowledge up-dating for practitioners by organising courses or orientation and re-training programmes during the vacation periods.

Research work and consultancy services are critical for industries both for solving production problems and for adapting and developing technologies appropriate to the needs of national economies. Since universities constitute the largest pool of expertise and intellect in any developing African country, they owe it as a duty to put that expertise to use through research to solve development problems and to disseminate the results of research through publications and consultancy services. These services must be paid for but the quality of the services and the manner of rendering them must meet the expectations and requirements of industries. At the request of the agencies and institutions concerned with stimulating industrial growth, universities can undertake research and provide consultancy services on the design of particular institutions for promoting industries, evaluate the effectiveness of their operations, the manner of eliminating constraints, the requirements of clients etc. They can also undertake prefeasibility studies, market surveys, manpower surveys, cost analysis etc. for financial institutions interested in promoting indigenous entrepreneurship. They can serve as consultants in designing and evaluating industrial training curricula and programmes of given industries or agencies promoting industrial development. One important role which has not fully been exploited in African universities is direct involvement in industrial extension work similar to agricultural extension work in some universities. The Faculty of Engineering, for instance, can provide more relevant professional training when it combines classroom academic work with practical training in its production workshop and gives its students and staff opportunity to get involved with solving production and distribution problems in industries through its extension services. In this regard African governments have been slow in obliging universities to get involved in extension work and in providing them with funds for research oriented to the needs of industrial extension services.

(ii) Post-secondary technical institutes

What has just been said or proposed in the preceding sub-section equally applies, although on a reduced scale, to polytechnics,

colleges of technology, management development centres and technical institutions operating at the upper secondary and post-secondary levels. All these institutions are concerned with manpower training with most of their output at the technician, foreman and frontline management levels as well as support service personnel such as clerks, secretaries and accounting personnel. Their training programmes thus provide the main source for the staffing of executive, supervisory, operational and field service duties as well as the accounting and clerical services of various industrial promotion institutions. The quality and relevance of the training they offer go a long way to influence the job attitudes of their graduates and the quality of the services rendered by these graduates and the institutions employing them.

Their research and consultancy work, assistance in curriculum development as well as direct involvement in industrial extension work, similar to those of the universities, also contribute to strengthen the efforts of industrial promotion institutions. Being less preoccupied with academic excellence and more oriented to developing capability for getting work done, their research and consultancy services are likely to be more relevant to the needs of industries. As was the case with the universities, African governments are yet to provide these middle-level training institutions with the means and encouragement to engage in more industrial extension work.

(iii) Vocational training institutions:

Vocational training centres, trade schools and commercial schools are all concerned with training junior technicians, skilled operatives, craftsmen and other semi-skilled workers. They also produce clerical, secretarial and junior accounting personnel. Their main contribution therefore is the production, training and retraining of the lower middle-level and junior executive hands that carry out routine technical work, operate specific services and are generally in direct contact with the clients the industrial services and incentive schemes are supposed to benefit. Their instructors occasionally get engaged in practical research and consultancy work, largely to help solve production bottlenecks such as machine breakdown.

(iv) Management training institutes:

Institutes of Public Administration, Management Development Centres, Centre for Entrepreneurship and other related management and supervisory training institutions are principally concerned with developing managerial capability and supervisory skills. They operate at various levels, ranging from the level of high school graduates to that of university post-graduate and post-experience training. These are the institutions that train and retrain through short and long-term courses, the managerial and administrative personnel required for direction and control, and for the supervision of lower level executive hands in the various institutions with responsibility for promoting industrial development.

In addition to personnel training these institutions also engage in research directly related to production, financial, marketing and personnel management problems and provide management consulting services to industries and industrial promotion institutions. They are more practical in outlook and closer to the world of industries than are the universities. They are hardly involved in field extension services.

(v) Inplant training institutions:

Every enterprise that develops a well sustained training policy would invariably design in-house training schemes and programmes. If its resources and number of employees are substantial it will create its own training school or training workshop and employ professional trainers to look after the training and retraining of its employees. In-plant training workshops or schools are also established in-house training programmes such as the East African Railway Training Workshop in Nairobi and the Ethiopian Airlines Training School for Pilots which has gained continental reputation to the extent that it regularly admits trainees from other African countries. Sometimes several firms in a given industry, as in transportation, pool resources to establish their own training school or workshop. The East African Management Institute, Arusha, originated in this manner and was established mainly to cater to management training needs of the various public enterprises formerly owned by the defunct East African Community which comprised Kenya, Uganda and Tanzania.

Inplant training institutions are principally concerned with training personnel at different levels, with concentration on middle and lower levels. Any research they may engage in is usually concerned with identifying production bottlenecks, reducing costs, eliminating wastes and search for methods of improving efficiency. In in-house training programmes all activities are tailored to the immediate and direct needs of the plant.

Training is also carried out informally on-the-job, with supervisors, executive officers and other senior, experienced officers providing training in operational methods, rules and procedures etc. Occasional group discussions, seminars, lectures and demonstration sessions offer additional informal training opportunities in every establishment.

(vi) Industrial Training Council and the Training Fund

Industrial Training Council is a constituted national authority with special responsibility for promoting industrial training in all sectors; accordingly, it has the task of coordinating and formulating national industrial training policies and, as appropriate, setting criteria for certification and recognition of different levels and types of industrial training. Its principal means of promoting training development is the Training Fund to which employers of certain level of having more than a certain number of employees are obliged to contribute regularly. Out of this fund the Industrial Training Council sponsors or supports industrial training in various fields and re-imburses employers contributing to the fund a certain proportion of their outlay on personnel training. The training fund approach to industrial and vocational training in developing countries has worked very successfully in most of Latin American countries and more recently in Indonesia.

The main role of the Training Fund and of the Industrial Training Council has been to promote sound industrial training, harmonize industrial training policies at the national level, mobilize resources for training and support the effort of training institutions in human resource development. Although the value of this training institution has been widely accepted, it has not yet been possible for most African LICs to consider adopting and practicing it. There are several difficulties which include

the limited scale of indigenous sector operation; the scarcity of managerial manpower; and the lack of resources for providing the seed money for getting such ambitious training programmes started.

(v) Conclusion: Some manpower issues

This paper has dealt with general and specific aspects of manpower training for the effective operation of various institutions that have been established or should in the near future be established for the purpose of stimulating industrial growth in African LDCs. From the analysis it was obvious that a variety of industrial promotion institutions would need to be developed but that even if the funding of such institutions were feasible the countries themselves would be hard put to it looking for capable nationals to design the required institutions and operate them efficiently and effectively in terms of goal oriented results. Above everything else they experience population and financial constraints and their training institutions are inadequate to the task of training locally all the qualified manpower they need.

Industrial growth in African LDCs is critical for the achievement of the 2% African share in world industrial output by the year 2000 A.D. These countries total nearly one-third of African States and some of them are endowed with vast natural resources which must be developed for industries if Africa is to achieve the target set for the industrial sector. At the country level they would need to boost output in the industrial sector of their economies both for increased employment and for income. It is for these reasons that they need to develop new and effective institutions as well as strengthen existing institutions for the promotion of industrial growth, including training institutions. To achieve this objective, it would be necessary for a number of manpower issues to be appreciated and resolved.

First, there is the need for a clear national policy on industrial training and on the development and operation of appropriate institutions for stimulating industrial growth. This would need to be backed with the establishment of appropriate machinery of government to give the right guidelines for the development, operation and supervision of institutions for industrial promotion.

Industrial training policy, to be effective, would need to be backed with adequate human and material resources (management and teaching staff and funds for training) if policy is to be translated into practical and relevant programmes and services for the benefit of industry.

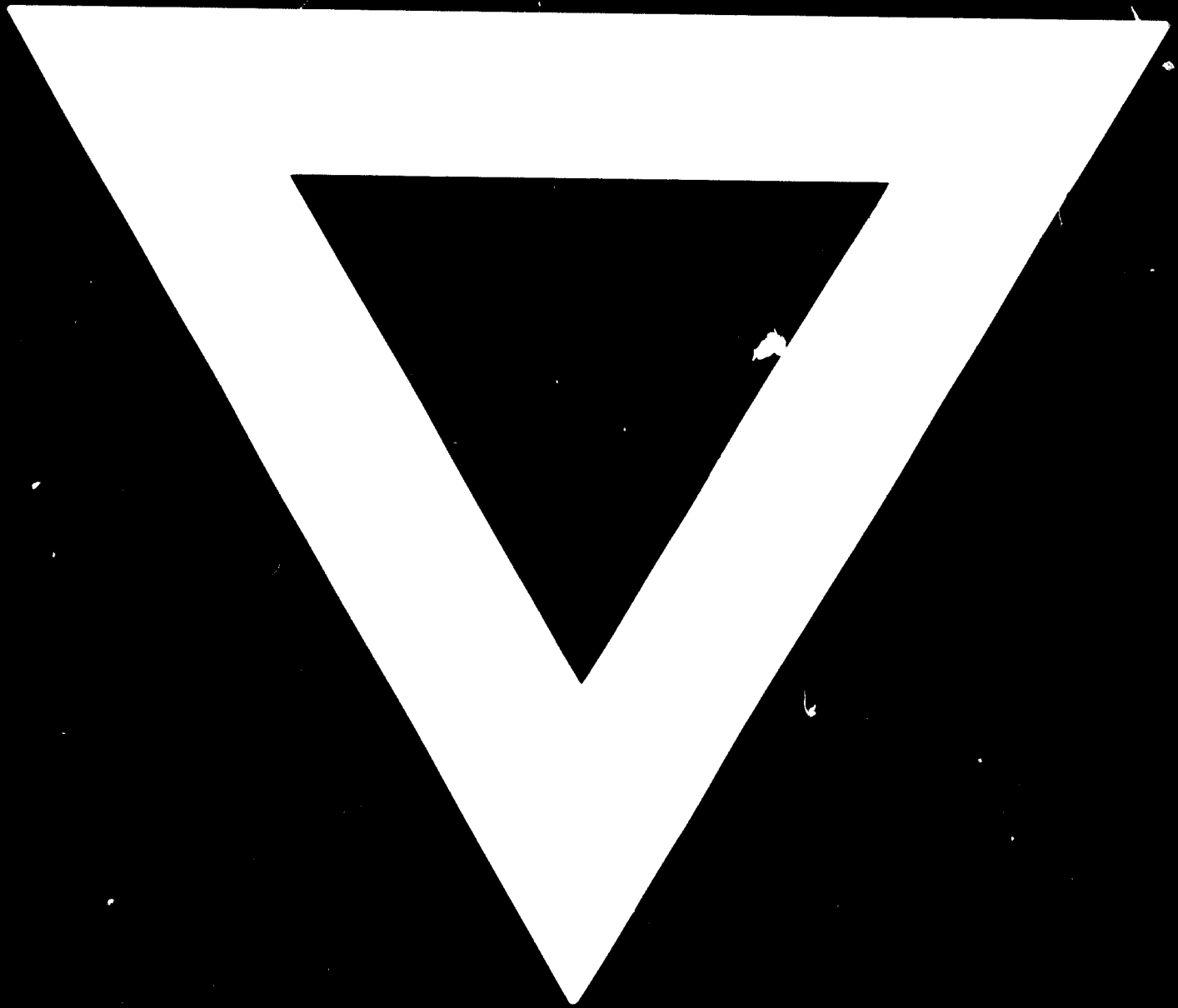
Manpower training, in African LDCs are both quantitative and qualitative. Designing relevant programmes, increasing training facilities or training institutions, using more effective teaching/training methods and media, and training more teachers are all expensive but necessary requirements. Equally important for industry is the need for African teachers to acquire short-term practical experience in industries and for their technical and management students to have similar practical exposure in industries.

Since facilities for training in certain specializations that are vital to industry and to the management of industrial promotion institutions are rather inadequate or totally unavailable in most African LDCs, consideration would need to be given as to how these facilities can be created and developed and the related professional examinations and qualifications localized in African countries. This leads to the important issue of intra-African cooperation in developing and utilising specialized training and research institutions. Some of the required training institutions may be too expensive for some countries to establish on purely national basis; in some other cases while a country might be able to afford the initial cost, it may find both the running cost and ability to make economic use of the facilities quite beyond its reach.

Finally, attention would need to be given at all times to the quality of the men and women who administer various institutions designed to stimulate industrial growth. Their training, remuneration and deployment are most important. Equally important should be their professional calling, their integrity and faith in their work. Essentially, their vocation is to render services that will facilitate the industrial

development efforts of entrepreneurs in national economy. To attempt to slow down the facilitation services would need to be seen as a disservice to the nation, and to ask for any consideration before rendering a service for which one is officially paid to render should be seen as a breach of professional ethics and a sabotage of the national development effort. Since the quality and force of character required in the men and women who administer various industrial promotion institutions cannot be achieved in a once-for-all training effort and words of exhortation, personnel training in these institutions would be seen as a recurring requirement and should accordingly be provided for on a planned basis.

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