DOCUMENT RESUME

ED 055 977 SP 005 335

AUTHOR Harbison, Frederick H.
TITLE A Human Resource Approach to the Development of African Nations.
SPONS AGENCY American Council on Education, Washington, D.C. Overseas Liason Committee.
PUB DATE [71]
NOTE 22p.

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Developing Nations; *Economic Development; *Human Resources; Manpower Development; *Manpower Utilization; Population Growth; Public Education; Rural Areas; Underemployed; Unemployment
IDENTIFIERS *Africa

ABSTRACT

The growth, prosperity, and viability of the new African nations will depend ultimately on their ability to develop systematically and to utilize effectively their human resources. The major human resource problems are 1) rising unemployment in urban areas, 2) under-employment of the rural masses, 3) shortages of strategic skills, 4) poorly geared educational systems, and 5) excessively high rates of population growth. The required development strategies would include labor-intensive employment generation in urban areas, rural development oriented to small farmers, and emphasis on "non-formal" education. The human resource approach in building such strategies recognizes the importance of increasing the total material wealth or GNP of African nations, but gives higher priority to the goals of full employment, more equitable income distribution, and relevant skill and knowledge development of the labor force. The techniques of human resource assessment range far beyond the traditional type of statistical surveys of high level manpower. They involve continuous enumeration of the labor force, tracing of career patterns of school leavers and university graduates, the study of the labor-absorptive capacity of different industries, and the calculation of cost-effectiveness of investments in human resource development. (RT)

A HUMAN RESOURCE APPROACH TO THE DEVELOPMENT OF AFRICAN NATIONS

TABLE OF CONTENTS

A PROFILE OF HUMAN RESOURCE PROBLEMS

The term "human resources" is subject to multiple meanings and uses. In the broadest sense, it encompasses the aggregate potential of people, based upon native capacities and environmental experience, for accomplishment of every sort. In this paper it is defined more specifically: human resources are the energies, skills, and knowledge of people which are, or which potentially can or should be, applied to the production of goods or rendering of services in an economy. Thus, human resources connote man in relationship to the world of work, and such work involves producing things and rendering services of all kinds in the social, political, cultural, religious, and economic development of nations. The human resource approach to national development is people-oriented, but it by no means presumes to encompass the full range of human aspirations or endeavors. Man may work to live, but hopefully, he lives for much more than work. The energies and skills of people as members of the labor force are only one facet of human development which embraces as well the thoughts, motives, beliefs, feelings, aspirations, and culture of human beings beyond and outside of work.

In the final analysis, the wealth and prosperity of nations depend upon the development and effective utilization of human resources. Capital and natural resources are passive factors of production; human beings are the active agents who accumulate capital, exploit natural resources, build social, economic, and political organizations, and carry out national development. Clearly, a country which is unable to develop the skills and knowledge of its people and to employ them effectively in the modernization process will be unable to develop anything else. The thesis of this paper, therefore, is that human resources are *central* to development, and not simply another factor bearing some relationship to economic growth and modernization.

The human resource "problem profile" of the African countries as they enter the decade of the seventies is relatively easy to chart. The solutions for the problems identified, however, are neither simple nor obvious. The formulation of policy for tackling problems is difficult and nearly always controversial.

The overriding human resource problem is the high rate of population growth, which in most African countries is currently between 2½ and 3 percent per year. As infant mortality continues to decline and birth rates remain constant, the consequent increase in the school-age population magnifies the expense of providing education and other services for Africa's younger generation. As a proportion of population, the percentage of younger people of school age is about double that in most advanced countries. Maintaining even the present percentage of youth who receive some formal education places extraordinary burdens on governments—and this is not considering the mammoth effort required to attain anything near universal primary education. The high rate of population increase also means sharply growing numbers of people in the labor force, most of whom will have to be absorbed in the rural areas. This can be illustrated by assuming the highest figure for percentage of population in urban areas (20 percent) and an aggregate 3 percent annual population increase. Accordingly, urban areas would have to grow at an annual rate of 15 percent to absorb even the annual increments in population. Such a rate is unlikely on the basis of past experience and any reasonable future expectation. It is clear, therefore, that the African countries, with very few exceptions, will have to support much larger numbers of people in rural areas in the future than in the past.

The second dominant problem is sharply rising unemployment in the urban areas. This is chronic, not cyclical, unemployment, and it is steadily increasing in most countries. The jobless rate is particularly high among youth; often several times greater than for the older age groups. Even with the impressive rates of economic growth and rapid industrial development which have occurred in many countries, new job opportunities in the modern sector have not been substantially increased. In addition there is mounting underemployment and overcrowding in the intermediate urban sectors which encompass such activities as small family workshops and enterprises, garages, repair shops, taxi

and lorry transport, and small-scale retail trade. Finally, there are mushrooming subsistence activities where people may be technically at work, but effectively idle, as peddlers, hawkers, beggars, casual workers, shoe-shine boys, or "retailers" who sell cigarettes one-by-one to those who are unable to purchase a full pack. The extent of urban unemployment has been carefully studied and needs no further elaboration here.[1] The political explosiveness of the problem is also now well understood by practically all African leaders.

A third related problem is underemployment of the rural masses. Here the underutilization of human resources is best defined in terms of persons whose incomes are so low (whether in real or money terms) that they exist barely at the subsistence level. The vast majority of Africans live under such conditions. Modern sector progress has bypassed them completely, and the gap between them and the employed labor force in the cities has been widening. Although perhaps not so imminently explosive, the failure to utilize effectively the rural labor force is by far the largest and most intractable human resource problem in Africa today.

A fourth point in the problem profile is the shortage of critical skills. The surveys of high and middle level manpower in nearly all African countries have identified with almost monotonous uniformity the shortages of engineers, scientists, doctors, qualified teachers, agronomists, and accountants. Even more critical is the scarcity of sub-professional and technician level manpower. Skilled craftsmen are in short supply in Africa as indeed they are in most countries, advanced and underdeveloped alike. But most serious of all is the dearth of model farmers, "animateurs," community development leaders, cooperatives managers, rural craftsmen, and other manpower needed to plan, organize, and implement a rural transformation. The architects of agricultural development programs often assume that in one way or another such skilled manpower will "emerge from the woodwork." The fact is that very little is known about the numbers of such persons who are needed, the nature of their required skills, nor the kinds of organizations necessary to mobilize their energies. Thus, the investigation and development of and investment in appropriate programs of skill and knowledge expansion, whether through formal or non-formal education and training, is central for the formulation of any human resource strategy.

The fifth major human resource problem area is formal education. In the African countries, in particular, education has been a "high-growth" industry. Its rate of expansion, especially at the secondary and higher levels, has far outpaced that of directly productive activities, and its momentum is such that it may continue to expand much more rapidly than national income in the seventies. But in many important respects, formal education, which is consuming human and financial resources at an ever-increasing rate, is poorly geared to the needs of African development. It is oriented almost exclusively to modern sector development and has limited relevance for the masses of the population who may never gain access to that sector. Formal education, therefore, needs to be critically evaluated from the human resource perspective, in terms of its role in producing useful and employable people for all sectors of the economy. Julius Nyerere's concept of "education for self-reliance" is evidence of the growing awareness of this problem on the part of modern African statesmen.

A final major human resource problem is what might be termed the "brain balance." The African countries have been importing high level manpower such as engineers, scientists, experienced managers, economists, and teachers through technical assistance arrangements, expatriate business corporations, or direct hire from other countries. This "brain gain" was crucial in the early years of independence, and it is likely that some "renting" of skills will continue during the seventies. But as the African countries approach "self-sufficiency" in high level manpower, some of the better educated Africans may migrate to the advanced countries in response to higher pay and better employment

1. See in particular Charles R. Frank, Jr., *The Problem of Urban Unemployment in Africa,* Discussion paper No. 16, Research Program in Economic Development, Woodrow Wilson School, Princeton University, Princeton, N.J., 1970.

opportunities. This has already become a serious problem in India as well as many of the Latin American countries. A "brain drain" of serious proportions may not be far off in many African countries as university outputs continue to rise after most expatriates have been replaced.

Such, then, are the principal human resources problem areas: rising population growth; mounting urban unemployment; underemployment of the rural masses in low-income subsistence activities; shortages of critical skills; formal educational systems poorly geared to development needs; and the maintenance of an appropriate "brain balance" in the international migration of talent. A comprehensive human resource assessment must come to grips with all of these problems. It must at least identify some of the possible avenues for solution, and it should pose the most critical questions for further inquiry and research as a basis for a sound strategy of development. This is a far more extensive and sophisticated task than the mere conducting of surveys of the demand and supply of high level manpower needed for modern sector growth.

EMPLOYMENT GENERATION AND UNEMPLOYMENT IN THE URBAN AREAS

Rising unemployment in the rapidly modernizing African cities is the most obvious yet perplexing of all human resource problems. Can urban unemployment be alleviated through greater employment generation? Is it possible to restrict the supply of labor by stemming rural-urban migration? These are fundamental questions for any human resource assessment.

Some argue that the use of more labor-intensive technologies in manufacturing establishments might generate more employment in the modern urban sectors. They advocate, quite cogently, that various forms of capital subsidies to new enterprises be eliminated and perhaps replaced by labor subsidies. In project selection, they would consider employment creation of equal or greater importance than rates of return on investment; however, there are serious drawbacks to this approach.

It is questionable, in the first place, whether there is a great deal of choice in the selection of technology for new manufacturing enterprises. Machinery is imported from advanced countries where labor-saving rather than labor-using processes are the major concern. The arbitrary selection of older technology might seriously jeopardize the long-range objective of African manufacturing firms to compete in international markets. In some cases the use of modern technology economizes on managerial and supervisory talent which is in short supply in African countries. Finally, since the total number of persons employed in modern manufacturing is so small anyway (in most African countries 2 to 3 percent of the labor force at best), the resulting increase in new jobs, even if all available labor-intensive technologies were utilized, would be minimal. The more likely prospect is that governments might simply order the manufacturing enterprises to employ more labor than needed. In effect, this has been tried on two occasions in Kenya but without long-range positive impact on employment.

In non-manufacturing activities of the modern sector the possibilities for employment generation may be greater. For example, construction, government services, and, above all, education are highly labor-intensive. Together they employ several times the manpower in modern manufacturing. These activities, however, are characterized by sharply rising costs; therefore, their expansion is strictly limited by the availability of public revenues. Furthermore, African countries perhaps have devoted too large a share of resources to urban public works in the last decade. Swelling the ranks of government bureaucracies rather than giving higher priority to more productive activities may also be unwise, and greater expenditure on urban education would only increase the already too-wide disparities between rural and urban areas.

On the whole, in the seventies the maximum annual rate of new job generation in African cities is not likely to exceed 10 percent; a more likely average would be 5 percent; in some cases there may be no increase at all.[2] Even assuming the high rate of 10 percent in a country where the total labor force may be growing at 3 percent, the modern sector at best could absorb less than a third of the annual increment in the labor force during the next few decades.

Table 1: NON-AGRICULTURAL EMPLOYMENT IN SEVERAL AFRICAN COUNTRIES

		Growth Rate of Non-Agricultural Employment	Population Growth Rate[3]
Cameroon	1955–1966	0.1	2.1
Ghana	1955–1966	4.0	2.7
Kenya	1955–1966	1.4	2.9
Malawi	1955–1964	-1.0	2.7
Nigeria	1956–1965	2.5	2.5
Rhodesia	1955–1967	0.8	3.1
Sierra Leone	1955–1967	3.5	1.5
Tanzania	1955–1966	0.6	2.5
Uganda	1955–1967	0.9	2.5
Zambia	1955–1965	1.1	3.1

Source: Charles Frank, *loc. cit.*; and *UN Demographic Yearbook*, 1969.[3]

The intermediate sector of the urban economies may have greater potential for employment expansion. In most African countries, this is a dynamic sector which for the most part lies beyond the reach of present employment statistics. But this sector manufactures for, sells to, and services the bulk of the urban population (witness the market woman system in Ghana) and will, of course, automatically expand as levels of income, particularly in the modern sector increase. It is highly labor-intensive, and wages and earnings are low. It could be modernized and expanded through greater use of intermediate technologies appropriate for making small industries more productive with minimum inputs of capital [4]

At present, however, the African countries are short both of know-how and determination to develop and apply such intermediate technology. Local scientists and engineers, steeped in knowledge about the modern technologies of advanced countries, show little interest in it, and research organizations in the advanced countries see little profit in studying and developing it. Even where intermediate technologies may be available, the delivery systems for their application are as yet undeveloped. Thus,

2. Charles Frank, *op. cit.*, p. 5

3. David Turnham, *The Employment Problem in the Less Developed Countries*, OECD, 1970, estimates that all underdeveloped countries may expect not less than 25 percent growth in numbers wanting work between 1970 and 1980 as compared to only about 10 percent for developed countries. In many of the African countries there were declines in modern sector employment in the middle sixties. In Zambia in 1964 it was below that of 1955. The Development Plan called for an additional 100,000 jobs between 1964 and 1970, though the labor force was expected to increase by 200,000. In Ghana the excess of manpower output over jobs (labor absorption) accumulated to 108,032 between 1961 and 1965. In Tanzania the increase in non-agricultural employment of 58,000 from 1964 to 1968 was almost offset by losses in agricultural employment. In Kenya employment in 1966 was nearly up to the level of 1960; the Economic Survey of 1968 projected 135,000 new jobs by 1970 but said "any overall increase in employment will have to be sought. . .[in] development in small scale agriculture." Theproblem is of course aggravaged by the move of excess labor to the cities. Some representatives rates of growth for urban agglomeration are: Lusaka, 11.7 percent between 1950 and 1966; Kumasi, 12.3 percent between 1955 and 1968; Nairobi, 7.2 percent between 1948 and 1968; Accra, 8.1 percent between 1948 and 1968.

4. Intermediate technology is hard to define. Some have defined it as "between the primitive and ineffective technology that accounts for the poverty of the poor and the extremely capital-intensive, sophisticated technology which rich societies are able to apply because they are already rich." See Council of Europe—Conference on Employment Development, Annex 1, Summary of Preliminary Draft Report, held in Rome, November 26-27, 1970.

and direction of it. The task of building a universal national youth service and directing its activities exceeds the capacities even of many advanced countries. Progress is being made, however, in organizing national service programs on a limited scale in many African countries, and further investigation, research, and experimentation would certainly appear to be appropriate.

Regardless of the success of any of these approaches, the conclusion is inescapable that the two most effective ways of limiting the increase of urban labor forces are population control (a very long-run measure) and retention of surplus labor in the rural areas. But to assume that labor will remain on the land in subsistence agriculture is unrealistic. The labor reserve can be held in rural areas only if the standard of living can rise in relation to that of the employed workers in the cities. Narrowing the income gap between rural and urban dwellers calls for a rural transformation which in turn would necessitate a major shift in development priorities in practically all of the African countries.

RURAL DEVELOPMENT

Much has been said about underemployment and disguised unemployment in agriculture. The bulk of Africa's labor force is in the rural sector, and as already indicated the rural population is destined to increase in absolute numbers in the next several decades. Employment generation in agriculture,[8] or more specifically, increasing the productivity and income of the rural masses, must come from broadly based rural development.

At this point, however, the term "rural development" should be defined. It encompasses much more than an increase in agricultural and livestock output and productivity. Village and small town development, extension of health and education services, expansion of local trade and commerce, organization of cooperatives, the provision of credit, the creation of local industries for processing agricultural products, and the improvement of housing, water supplies, sanitation, roads, and communications are all within its scope. It necessitates investment in many kinds of rural public works in addition to those required for improvement of agriculture as such. Broadly based rural development, in short, means the transformation of stagnant, traditional societies into productive, dynamic rural economies.

The logic in favor of agricultural development is clear. It will help to solve the problems of hunger and malnutrition; it can reduce pressure on the balance of payments by reducing the need to import food; it will broaden the market for urban produced goods by increasing rural income. The technical problems of increasing output to provide enough food for Africa's growing population are probably solvable. But, from a human resources standpoint, the *means* of expanding agriculture is of critical importance. If the new technologies are introduced primarily on the larger farms, if labor saving machinery is employed on an indiscriminate basis, if extension services are available only to the more prosperous landholders, agricultural development may curtail opportunities for those not able, for reasons of education, capital resources, nature of land-holding, lack of credit, or related factors, to take advantage of the new technology and thereby increase underemployment and even depress the incomes of the poor. In planning agricultural development, therefore, maximum utilization of the rural labor force needs to be given as much attention as the technologies which may facilitate a "green revolution." Up to now, unfortunately, faculties of agriculture in the universities and research institutions have largely neglected this problem by assuming that redundant labor will simply have to migrate to the cities.

8. For further discussion, see the forthcoming OLC companion paper on rural development by Carl Eicher.

It is also evident that agricultural development, as such, can absorb only part of the rural labor reserve. Employment will have to be increased by expansion of rural public works, rural education and health centers, small industries related to agriculture, trade, transport, and communications. All such activities are relatively labor-intensive, but they will, nevertheless, require a great deal of investment. Indeed, in most countries, a broadly based program of rural development may necessitate considerable shifts in national investment priorities, in high level human resource policies and in direct and indirect taxation of rural incomes.

In short, at the current stage of African development, knowledge about the strategies for rural transformation is sadly underdeveloped. The myth that the benefits of rapid industrialization in the modern sector would somehow trickle down to the rural masses has proven to be false. The limitations of expansion of employment in the cities are becoming ever more obvious, as is the fact that much of the problem of mounting urban unemployment will have to be solved through rural development. The need for greater production of food is widely accepted, and the means for achieving it are probably in hand. But the employment generation capacity of rural areas, and the means of utilizing it effectively still lie beyond the frontiers of knowledge. Here is undoubtedly the weakest link in the chain of human resource assessments.

THE DILEMMAS OF FORMAL EDUCATION

Formal education has a vital bearing on the development and utilization of human resources. It is a major determinant of who gets jobs and, in a negative way, it is a barrier which prevents people from getting them. It is thus a giant sorting machine. Education is a major generator of skills and knowledge for the labor force. It can and does influence attitudes, both positive and negative, toward work and commitment to national development. Education also tends to encourage rural-urban migration and it is a factor influencing fertility and the rate of population growth. Finally, in most African countries education is probably the biggest of all industries, employing more people than the combined total of commercial and manufacturing enterprises in the modern sector. In many countries it is also the largest consumer of its own product—educated manpower. Education is the avenue for solution of many human resource problems, but it also creates others. Though education can promote national development, at the same time it can be and often is a roadblock in the path of progress.

A distinction must be made between education planning and human resource planning. Education has other and broader purposes than human resource development. No educator would consider that his sole function is to prepare people for the labor force. Two companion papers will explore in depth the problems of formal education as a system, the direction of needed reforms, the urgency of innovation, and internal efficiencies. We shall deal here with only the major areas for assessment of the linkages between education and the world of work.[9]

During the sixties, the African countries invested heavily in education. Post-secondary school enrollments in the sub-Saharan African countries (excluding South Africa) increased from 27,200 in 1960 to 68,080 in 1965, an average annual increase of nearly 25 percent.[10] This means that the rate of increase in enrollments in higher education has been about five times the average annual increase in national income. In Nigeria, for example, university enrollments increased from less than 2,000 in 1960 to nearly 8,000 in 1967, exceeding even the ambitious Ashby Commission goal of 7,500 by

9. A paper on primary, secondary, and teacher education has been prepared by John Hanson, and a separate statement on higher education is to be undertaken by an OLC task force.

10. United Nations Educational, Scientific, and Cultural Organization (UNESCO) and Organization for African Unity (OAU), "Regional Educational Targets and Achievements," UNESCO–OAU/ TA/Ref 2 (Paris, 1968).

1970. In most middle African countries, the expansion of higher education exceeded the targets set in national development plans, and for the area as a whole, the observed increase in enrollment from 1960 to 1965 was 150 percent, as contrasted with a targeted growth of 91 percent at the Addis Ababa and Tananarive conferences in 1961 and 1962.[11] It is clear, therefore, that the growth of higher education in Africa has exceeded all expectations, and there is no sign of any significant slackening in the enrollment expansion.

The table below shows the relationship, in a few representative African countries, between average annual growth in GNP (per capita) and per capita recurrent expenditures on education. For example, in Ghana educational expenditures increased over 37 times as much as GNP.

Table 2. **PER CAPITA RATES OF INCREASE OF GNP AND EXPENDITURES ON EDUCATION* 1960-65**

	GNP	Recurrent Expenditures on Education
Ethiopia	2.5	13.5
Ghana	0.4	14.9
Ivory Coast	2.8	14.8
Kenya	1.3	4.5
Malawi	1.0	25.5
Nigeria	3.0	6.6
Senegal	-1.3	10.6
Sierre Leone	2.0	18.2
Zambia	3.9	45.4

*Values given are for average annual percent increases per capita.
Source: F. H. Harbison, Joan Maruhnic and Jane Resnick, *Quantitative Analyses of Modernization and Development*, Princeton: Industrial Relations Section, 1970. Chapter 7.

It would appear that the African nations need little further encouragement to invest in formal education. Systematic human resource analysis may help to determine whether African formal education is headed on a collision course with development objectives, and if so, what changes in direction might seem to be warranted. Some of the more urgent questions for consideration follow.

First, what are the projected requirements for middle and high level manpower (persons requiring secondary education and higher)? African countries have had a good deal of experience in making manpower surveys of this sort; the necessary techniques are available and need not be elaborated here. This is the most obvious and perhaps the easiest task to be undertaken.

The second question is much more difficult. How and where can "surpluses" of secondary school leavers and university graduates be absorbed. It is quite clear that in many, though not all, African countries the outputs of secondary schools and institutions of higher education are increasing much more rapidly than job opportunities in the modern sector enclaves. Until recently a substantial part of the demand for educated manpower has been for replacement of expatriates. Except in certain scientific and technical areas, positions now held by expatriates will be filled by nationals during the seventies, and by relatively young men who will not make way for still younger ones for a long time. The rate of net new job creation, for reasons explained earlier, is not likely to be high, and the positions which are available will be at lower levels of status and pay than was the case in the sixties. In some areas, such as Tanzania, Zambia, Botswana, and the northern states of Nigeria, shortages of

[11] *Ibid.*

educated manpower may continue through most of the decade. But in others, such as Kenya, Uganda, the southern states of Nigeria, and Ghana, unemployment of both secondary leavers and university graduates is already beginning to appear.

Shortages of highly qualified scientists and engineers may continue for some time, but unless there is considerable expansion of research and development activity, even they may become redundant. The number of established positions in routine government activities, manufacturing enterprises, and in teaching is not great. And high talent manpower, which sees low career horizons at home, is likely to migrate to greener pastures abroad.

Third, to what extent and in what directions must the orientation of formal education (particularly at the secondary and higher levels) be changed? The need for greater emphasis on mathematics, science, technology, and medicine is widely accepted. The shortage of major categories of sub-professional personnel is recognized. In many quarters, the "vocationalization" of secondary education is being pressed forward (for the most part, incidentally, without systematic analysis of the absorptive capacity of the economy for "school-trained craftsmen" at likely wage levels). All such changes, however, assume that there will be room in the modern sector labor force for all of the outputs of secondary and higher education. If the modern sector cannot absorb them all, what then are the more fundamental changes in orientation needed to make secondary and higher education more relevant to the tasks of modernizing the traditional and intermediate sectors?

A fourth and related problem concerns the unrealistic expectations of present and on-coming generations of students. Their predecessors in the sixties, entering a sellers' labor market operating under pressure to replace expatriates, easily found positions of high status and pay. They expect the same situation, and the large sums of money appropriated by governments for their education tend to re-inforce their belief. When students find that they are unemployed or are forced to accept jobs for which they feel they are "overqualified," shattered expectations will breed frustration and resentment. It is true that a university degree is an essential entry ticket into the high level labor market of the modern sector, but for many it will soon become admission for standing room only. The increase in the number of ticket holders, moreover, does not decrease the number of ticket seekers; it merely places at greater disadvantage those who do not have them. One way to promote more realistic expectations would be nation-wide tracer studies to throw more light on actual career pathways for the on-coming generations of educational manpower.[12]

A fifth major question is what to do about the masses of present and future young people who will have had little or no education even at the primary level. Are they to be "written off" as far as the modernization processes are concerned? Or can they be brought into the mainstreams of development through some kind of non-formal education or training?

Finally, what kinds of skills and knowledge can be developed outside of the education system? What kinds can be generated only through the education process? And where are the important trade-offs in development of human resources outside vs. inside the formal education system, and how can the relative costs and benefits best be measured? These questions lead directly to the analysis of the potential of non-formal education.

12. This is discussed in more detail below.

DEVELOPING THE POTENTIAL OF NON-FORMAL EDUCATION AND TRAINING

Human resource analysis is concerned with two systems of skill and knowledge generation: formal schooling and non-formal education and training. In most countries formal education connotes age-specific, full-time classroom attendance in a linear, graded system geared to certificates, diplomas, degrees, or other formal credentials. Formal education is easily defined. Its administration and control in most developing countries is lodged in a ministry of education; its costs are measurable; and its inputs and outputs are easily identified. In contrast, non-formal education, which is probably best defined as skill and knowledge generation which takes place outside the formal schooling system, is a heterogeneous conglomeration of unstandardized and seemingly unrelated activities aimed at a wide variety of goals. Non-formal education is the responsibility of no single ministry; its administration and control are widely diffused throughout the private as well as the public sectors; and its costs, inputs, and outputs are not readily measurable. Non-formal education is perhaps one of the most "unsystematic" of all systems, yet in most developing countries its role in generating skills, influencing attitudes, and molding values is of equal, if not greater, importance than that of formal schooling. Indeed, perhaps most of man's development takes place routinely and often unconsciously through learning-by-doing, being instructed or inspired by others to perform specific tasks through association and communication with others or simply by participation in a community or in a working environment.

Non-formal education may be classified in three broad categories: 1) activities oriented primarily to development of the skill and knowledge of members of the labor force who are already employed; 2) activities designed primarily to prepare persons, mostly youth, for entry into employment; and 3) activities designed to develop skill, knowledge, and understanding which transcend the work world. These three categories may be illustrated by examples:

1. In the category of programs for development of employed manpower, the following would clearly be included: agricultural extension, farmer training centers, rural community development services, on-the-job training of craftsmen in all kinds of construction, in-service training in manufacturing and commercial enterprises as well as government agencies, labor education conducted by trade unions, apprenticeship arrangements, and most "learning-by-doing" activity in trade, marketing, cooperatives, and social and political organizations. Training may take the form of learning by trial and error, acquiring experience by intermittent or casual instruction, organized training classes, or systematic task rotation.

2. Activities designed to facilitate access to employment include youth brigades, village polytechnics, mobile training units, counseling, vocational training in the military, and other programs to build skills for entry-level jobs. These activities may be alternatives for, or extensions of, formal education in primary, secondary, or vocational schools.

3. Activities not specifically related to labor force participation include adult literacy programs, nutrition and health clinics, homemaking classes, family planning, and a wide range of political education schemes. In this category we would also include radio programs, newspapers, speeches, discussions, and day-to-day palaver from which we learn and acquire information.

The activities listed above are illustrative rather than definitive. Some are obviously relevant for all three functions of preparation for employment, development-in-employment, and building of skills and knowledge not directly connected with the working world. Farmer training centers, village polytechnics, and adult literacy programs are perhaps cases in point. But, in the aggregate, the skill and knowledge generating capacity of non-formal education is enormous. Without such activities, the production of goods and services would grind to a halt. The resources devoted to non-formal education, in time, energy, and other outlays are extensive. Yet, a systematic approach to this kind of human resource development is seldom included in the calculations of development economists, education planners, and political decision-makers.

The arguments for greater emphasis on non-formal education in development policy are cogent and compelling. First, the formal schooling system is becoming prohibitively expensive. High rates of population increase are swelling the school-age population. The laudable desire to upgrade the qualifications of teachers and to improve the quality of education by lowering student-teacher ratios leads to sharp increases in per pupil expenditures. The pressure for expansion of the more expensive formal education at the secondary, vocational, and higher levels magnifies further increases in costs. Non-formal education may offer, in many areas, a less costly and more attainable alternative.

Second, a sober realization is growing in Africa that, at least for the next two or three decades, very large proportions of the school-age population will have little or no access to any kind of formal schooling; this is, of course, in addition to the vast majority of adults presently without schooling. If one of the goals of modernization is to make every individual a "learning-station," then non-formal education is the only means of filling the gap between the "schooled" and "unschooled" population.

Third, non-formal education may be one means of counterbalancing some of the distortion created by formal education. To a considerable extent, formal education establishes the gateways to positions of wealth, status, and power. It issues entry passes in the form of certificates, diplomas, and degrees to a privileged minority; it blocks access by those without the proper credentials. But competence and learning are very often poorly measured by credentials. Achievement-oriented, non-formal education may provide the means for growing numbers of competent but "uncredentialed" people to reform the requirements for entry.

Fourth, in part because of its heterogeneity, disorganization, and lack of central direction and control, non-formal education affords greater opportunity for innovation than the often encrusted formal education establishment. This may have strong appeal both to the dispensers of external aid as well as to local statesmen who become impatient in their attempt to reform educational systems.

Finally, one may argue that without non-formal education the benefits of formal schooling will not be fully realized. Education, indeed, is a continuous, life-time process. Skills and knowledge generated in the formal schooling process may atrophy without the stimulation, extension, and enrichment provided by post-school, non-formal educational activity. In short, the continuation of human skill and knowledge generation over a life-time may be one of the best ways of maximizing the returns on initial investment in formal schooling.

In theory it would be desirable for all African countries to make a complete inventory of all non-formal education, to evaluate the usefulness of each separate activity, to plan extension and improvement of the most promising programs, to estimate their costs and benefits, and above all to build a strategy for integrating this motley assortment of unrelated activities into a logically coherent, functioning system. Such a master plan of non-formal education would be ideal, but few countries are either willing or able to undertake so comprehensive and time-consuming a task.

The more realistic approach is probably a sector-by-sector analysis which would concentrate selectively on a relatively small number of clearly defined but strategic leverage points for investigation and effort. The possible leverage points are many, and they would differ from country to country. Here, a framework for analysis may be useful, and a few examples may clarify possible approaches.

In some cases non-formal education performs unique functions which lie completely beyond the reach of formal schooling. In others, the non-formal activities may be an alternative to or substitute for learning in the graded school curricula. In most cases, perhaps, non-formal and formal education may be made complementary and re-inforcing. The benefits accruing from more effective integration of the non-formal and the formal systems may be greater than the sum of the individual returns from each.

Unique functions of non-formal education

Unskilled and semi-skilled workers in factories or construction are most easily trained on-the-job. The skill and knowledge of farmers are best generated through extension and/or farmer training centers. Almost by definition, adult literacy programs are beyond the range of age-specific, graded schooling. The same is true of nutrition, health, or family planning education. In this general area, the leverage points are to be found in better organization, coordination, and direction of related activities.

A plan for development of rural adult education centers in Kenya is a good example. Here the Board of Adult Education, in collaboration with the Ministries of Cooperatives, Social Services, Agriculture, Health, Commerce and Industry, Information and Broadcasting, Local Government, and Economic Planning and Development, has evolved a concrete blueprint for multi-purpose training centers at the district level which will provide facilities to both government and voluntary agencies to plan, integrate, and implement a number of related adult education activities. The centers, each with a resident director and staff, will determine priorities, coordinate rural educational activities at the district and sub-district levels, and facilitate the execution of programs. These will provide for maximum involvement of the local community in building programs directly related to the Special Rural Development Projects which are being established as an outgrowth of the Kericho Conference. They would thus constitute the apex of all rural extension and non-formal educational activity. This plan, essentially an extension of the farmer training center concept, raises many practical problems of interagency cooperation, but at least it is an attempt to rationalize the delivery of much needed rural services.

Non-formal education as an alternative to formal schooling

The training of craftsmen for modern sector activity poses another set of problems. For the most part, electricians, carpenters, masons, fitters, and automobile mechanics are trained in employment, either through apprenticeship arrangements or by some less formal means of learning on the job, but they can also be produced under a graded curriculum in formal vocational schools. Many ministries of education have attempted to "vocationalize" their secondary school systems either by building more technical schools or by establishing "comprehensive" secondary schools with vocational streams. Here the assumption is that craftsmen, foremen, and even technicians are best produced in a formal system. The area of greatest leverage for development planners lies in a careful analysis of the trade-offs and the optimal mixes between the two systems.

The training of automobile mechanics, as a typical case, illustrates the range of possible choices. In all developing countries there is a shortage of automobile mechanics in the sense that there are unfilled jobs at prevailing wage levels. Most young people learn the trade as apprentices in small garages and shops as described by Callaway.[13] The indigenous apprenticeship system could be improved by organizing training extension services to the garage owners, as well as by organized off-duty training classes in the principal towns or cities. The major distributors of automobiles and trucks are better producers of mechanics. They could be required, or encouraged by subsidies, to train a surplus beyond their immediate need in their own service department. Pre-employment formal training in vocational schools is another, and probably the most expensive, alternative. Combinations of all three avenues of training might in the end provide the most effective solution.

13. Archibald Callaway, "Nigeria's Indigenous Education: The Apprenticeship System," *ODU*, Vol. 1, Number 1, July 1964. pp. 67-69.

The training of building craftsmen presents a similar range of alternatives. The central problem is not what should be learned, nor even the techniques of teaching. The critical issue is the organization of training activity and allocation of responsibility for carrying it out. In most developing countries, the ministries of education, the labor departments, and the employing institutions pursue their independent courses, often at cross purposes. Perhaps only in the ministries of planning is there hope of building a strategy for a rational allocation of resources.

The organization of "training pools" has great potential as a leverage device. Here groups of employers may pool resources to provide common training services to meet their common needs. In the Latin American countries a tax levy on payrolls of all employers above a specified size provides ample funds to support central training organizations which provide both institutional and on-the-job training services. Many African and Asian countries are now considering various kinds of employer tax levy schemes as means of financing and organizing non-formal training activities for modern sector industrial and commercial enterprises. Training pools have very important advantages. They are extremely effective in tapping funds for training beyond the resources allocated by governments for formal education. They provide services more closely related to employer needs than formal vocational schools. They place responsibility on employing institutions for the training function. And, in many cases they can provide services at relatively low costs. It is quite possible that training pool systems, as an alternative to formal vocational schools, may become the centerpieces for training semi-skilled and skilled craftsmen in many developing countries.

There are, of course, other possibilities in most countries. The Mobile Trade Training Unit System in Thailand is one example.[14] Another is to force, or to induce by subsidy, large corporations to train craftsmen beyond their own needs. Our argument is that, in nearly every developing country, there are alternatives to formal education which should be carefully investigated.

Non-formal education as an improvement-factor in formal education

Non-formal education has great potential for improving the formal educational system. It can magnify those benefits which accrue from formal schooling, and in many cases it may lead to changes in the orientation of schools, technical institutions, and universities. The closer integration of non-formal and formal education may in the long run win the highest returns of all programs for human resource development. The list of possible leverage points is almost endless, but a few of the more obvious are mentioned here.

Technician training requires both theoretical education and practical experience. Shared-time arrangements between working, on-the-job training and formal instruction in technical institutions are proving to be effective in many countries. An outstanding example is the Kenya Polytechnical Institute where all students are sponsored by their employers.

At the Haile Sellassie I University in Ethiopia all students are required to spend one university service year doing practical work in government offices, schools, or business enterprises. In other cases, university students may serve internships as research workers on development programs. Some African countries require secondary school or university graduates to serve time in national service. In others, youth brigades are set up to provide practical re-training for school dropouts. Most of these programs, to be sure, have shortcomings both in orientation and practical organization, but with better planning and implementation, they may have great potential for the generation of more development-oriented, high level manpower.

[14] Vocational Education Department, Ministry of Education, *Mobile Trade Training Units, 1969 Report*, Bangkok, Thailand.

Perhaps the most productive area of all for better integration of formal and non-formal education is in the training of more effective cadres of rural service workers. Agricultural extension assistants, suppliers of rural inputs (fertilizer, seeds, tools, etc.), cooperative managers, and marketing experts all require considerable pre-employment formal education. At the same time, they need refresher training, information about changing technologies and markets, exchange of experience in "teaching" farmers, and other kinds of continuing skill and knowledge development. Here, non-formal education can be used to build upon the formal and may have the highest payoff of any program of rural development. Yet, by and large, the universities have neglected this function. Ministries may have inadequate resources to perform it. Thus, new organizations or the revitalization of old ones are worth serious consideration.

In summary, the range of activities in non-formal education is vast. The resources already invested in them are very considerable in the aggregate. Their contribution to national development is far-reaching. In some cases, non-formal education is the only practical means of skill and knowledge development; in others, it offers an alternative, and often a more effective one, to education and training than formal schooling; in most cases, it can supplement, extend, and improve the processes of formal education. The formulation of a strategy for development of non-formal education is no easy task. An initial step would be to identify the principal target groups, to specify the actual and possible roles of both formal and non-formal education in their development, to evaluate alternatives, and to select "leverage points" where more concentrated efforts would have the highest payoffs. Such efforts should be guided at every stage by cost-benefit analysis based upon the tracing of the career pathways of persons who have participated in the various programs.

THE RETENTION AND MOTIVATION OF AFRICAN BRAIN POWER

During the sixties, African countries were heavily dependent upon advanced countries for strategic high level manpower. Expatriates were retained in or recruited for high positions in government and industry. In many countries well over half of the qualified secondary school teachers were expatriates, and most of the top staff positions in the universities, medical centers, and research organizations were held by foreigners. Africa was flooded by study commissions, expert advisory groups, and technical assistance missions whose function was to identify problems, recommend programs of action, and in general to tell Africans how to develop their respective countries. In this period, the African nations imported not only talent but also basic strategies for development.

Without question, complete Africanization of strategic positions in both public and private sectors is a first priority goal of virtually every new African state. By the end of the seventies, most will have achieved this objective. Then their problem will not be "renting" talent from abroad but making the most effective use of African high talent manpower which will have been generated locally at great cost and the sacrifice of expenditures on other development-oriented activities. As the jobs of expatriates are filled and as the outputs of the universities multiply, it would be a tragedy indeed if the African countries were to suffer a "brain drain" similar to that of India and many of the Latin American countries.

High level manpower tends to migrate from countries which offer meager opportunity for effective utilization of talent. Scientists, for example, will not be content for long as secondary school teachers; engineers are not likely to be happy in minor technical and administrative positions in government bureaucracies. Social scientists will move to greener pastures abroad if they are sentenced to teach orthodox theory or the principles of academic disciplines developed in foreign countries. The challenge for the seventies is to mobilize Africa's emerging brain power for work on the major problems of national development.

The key to retention of high talent manpower in the African countries is to build a strategy for *effective utilization* of local brainpower. The market for men and women of high talent is more international than local. Highly qualified Africans will be offered positions of high status, attractive pay, and challenging opportunities for personal development by international agencies and also by private interests in the more advanced countries. It may be true that any less developed country has the power to forbid its citizens to migrate to other countries, but attempts to do so have almost universally failed. On purely pragmatic grounds such restrictive measures are of very dubious value. The only practical means of retaining precious talent will be to increase the incentives for highly trained and educated manpower, and in particular the exceptionally well qualified persons among this group, to choose freely to remain at home in their nation's service. In this respect, some of the conclusions of a recent definitive study of international migration of talent are relevant.[15]

The first element for a viable strategy is a rational design of the educational system. This calls for orientation of education, particularly in the universities, to a country's specific development needs. Since this point is stressed throughout this paper, no further elaboration is necessary here.

Second, it is necessary to identify and support those imaginative, energetic, and effective individuals who are enthusiastic leaders in strategic areas of national development. Such areas may range from industrial innovation to basic science, rural development, public health, national planning, or applied research. A "critical mass" of such talent is imperative for productive research and broadly based interdisciplinary approaches to national development, which in turn calls for concentrations of both faculties and talent in "centers of excellence." For this group, it may be necessary to provide special incentives in the form of pay, research laboratories and opportunities for maintaining contact with their peers outside the country.

The central argument here is that the African countries would be foolish to commit vast resources to the education of highly talented manpower without advance preparation for maximum utilization of their skills. To do so would be like investing in jet aircraft before developing the airports to accommodate them. "Centers of excellence" and viable research organizations require long gestation periods, and their foundations must be laid now if serious losses of brainpower within the next decade are to be prevented. Finally, it is well to recognize that the brainpower which will either remain in the African countries or migrate to greener pastures is already in the educational pipelines.

THE HUMAN RESOURCES AND THE GNP APPROACHES

Human resource problems in African countries are associated with and central to every aspect of national development. At the minimum, a comprehensive human resource policy would require strategies for labor-intensive employment generation in urban areas, for raising the incomes and productivity of small farmers and rural dwellers, for building the skills and knowledge of middle and high level manpower for the modern sector--including the cadres and village leaders for rural development, for more effective gearing of the system of formal education to the needs of national development, for maximizing the skill generating capacity of the system of non-formal education and its effective integration with formal schooling, and for retention and maximum utilization of the growing numbers of highly educated Africans in national development. Many of the major elements and/or central questions in evolving such strategies have been listed in this paper. The list, however, is far from complete.

15. Committee on International Migration of Talent, Education and World Affairs, *The International Migration of High-Level Manpower: Its Impact on the Development Process*, New York: Praeger, 1970. In particular, Part VIII. Conclusion, pp. 667-728.

The main argument of this paper is that a primary task of national development policy is the solution of human resource problems. The human resources approach to development is relevant but not subordinate to the GNP approach. A human resource assessment, therefore, is not simply a statistical estimate of manpower inputs required to achieve a given rate or level of economic growth; it is rather a perspective for planning and implementing national development. The human resource approach implies a fundamental rethinking of the development process.

Until recently overall economic growth has been the supreme target of national development planning in most African countries. The rate of increase in national income, or in GNP, is accepted as the primary measure of progress. Growth targets, specified in terms of output and contribution to national income, are established for each major sector of the economy and projects are evaluated on the basis of their potential contribution to sectoral growth. An underlying assumption is that unemployment and underemployment of human resources will diminish and the living standards of all will rise if the rate of growth of GNP can increase rapidly enough. Levels of employment and efficiency of utilization of human resources are thus consequences or by-products of the growth of national income. In this approach efforts to alleviate unemployment or to develop strategic skills are conditioned by and subsidiary to the central objective of maximizing economic growth.

In setting targets for economic growth, for example, the GNP approach would imply that to raise the income of the unemployed is no more important than to raise the income of the richer elements of the community. Indeed, the GNP approach is not centrally concerned with the processes which spread the benefits of growth, the balance between modern and traditional sectors, the disparities between urban and rural dwellers or the general involvement of the people in the march of economic progress.

The experience of African countries in the last ten years has shown that there is no certain linkage between increases in production and increases in employment. In most cases, relatively high growth rates have been accompanied by disappointingly small increases in wage and salary employment. In some, modern sector employment levels have actually fallen. In many African countries high growth rates have led to widening income gaps between the rich and the poor as well as between urban and rural areas, and the greater proportion of the population has been denied opportunities either to contribute to or benefit from development. Economic progress is bypassing the swelling ranks of the underclass.

Today, there is a growing movement among planners and economists to "dethrone GNP" as the primary measure and objective of development policy. The rationale is that other criteria are equally if not more important indicators of progress if development is to bring about higher standards of living and a more hopeful future for most of the people in the less developed countries. As stated by David Morse, the original prime mover of the World Employment Program of the ILO, ". . . employment must take its place, alongside GNP—and of equal prominence—as a central object of concern in development planning and an essential criterion in examination of progress in development."[16] The same approach underlies the report of a team of economists commissioned by the ILO to draw up a strategy for full employment in Colombia in 1970.[17] The Colombia exercise indeed specifies full employment as the major goal of development and then devises sector-by-sector growth targets to achieve it.

16. David A. Morse, "Dimensions of the Employment Problem in Developing Countries," paper prepared for the Cambridge Conference on "Prospects for Employment Opportunities in the Nineteen Seventies," September 1970. ** Internatio

17. International Labour Office, *Towards Full Employment*, A Program for Colombia, Geneva, 1970. For a short summary, see Dudley Seers, "New Approaches Suggested by the Colombia Employment Program," *International Labour Review*, October, 1970.

Both Morse and the ILO experts involved in the Colombia study are in effect promoting a doctrine which is quite similar to what we call the human resources approach which holds that the maximization of employment opportunities as well as maximum development of skill and knowledge of the labor force should become central objectives of development policy. Overall economic growth is looked upon as a consequence or by-product. Sector analysis concentrates on expansion of jobs and generation of skills. Poverty is assumed to stem from lack of opportunity for productive work rather than from lack of income as such. And thus rising incomes and consumption by the masses are thought to follow naturally from a well designed strategy of development and utilization of human resources. Employment depends not only on how goods and services are produced but also on *what* goods are produced, and the distribution of income not only reflects but also is a cause of unemployment.

The human resource approach and the national income approach, however, are not necessarily inconsistent. The "dethronement" of GNP by no means implies that it should be rejected. Indeed, the human resource approach states that effective utilization and development of *all* segments of the labor force will maximize levels of income and standards of living by mobilizing all human resources in the income generating process. The GNP approach would maximize income without regard to who is involved in the process. The fruits of progress among the population would then be distributed by appropriate income transfers. The human resources approach emphasizes at the start the sharing of progress by participation of the masses in productive work as the centerpiece of the income generating process. In theory the two approaches may lead to the same results, but along the road to development, they imply different priorities, time sequences, and perspectives.

The human resource approach would not imply that the employment of masses of workers in unproductive activities such as building pyramids or temples is constructive; nor would the GNP approach justify the proliferation of luxurious government office buildings as the most desirable way to increase national income. The human resource approach would not argue for maximum employment expansion in the short run at the cost of foregoing significantly greater expansion in the long run. Nor would the GNP approach be oblivious to the long-range importance of expansion of employment for sustained economic growth.

Both the human resource and the GNP approaches, therefore, provide essential and logical perspectives for determination of national develpment policy. Other perspectives, too, are relevant. Progress is not measured solely by materialistic criteria, and, inevitably, some conflict of goals is inherent in all programs for development. Compromise between as well as blending of values and goals is inherent in the process of national development.

SOME TECHNIQUES OF HUMAN RESOURCE ASSESSMENT

The human resource assessment process, as demonstrated above, suggests a far-reaching agenda for research. There is thus no simple model for a "human resource survey." A few useful techniques, however, warrant brief description.

Manpower surveys

The traditional high and middle level manpower survey is the most common of such techniques. For the most part, manpower surveys in African countries have started with inventories by occupational classification of middle and high level manpower in medium and large sized enterprises in the modern sector (usually establishments employing 10 or more persons). Assumptions are made about desirable or appropraite educational qualifications for the various occupational categories. Existing

All things considered, we would strongly urge that external resources be invested in further development of the tracer process in Kenya—provided that there is evidence of strong support by government and employers.

A very promising new proposal now under consideration in Kenya is to combine the tracer survey idea with the annual labor force enumeration. Under this scheme, each school or university leaver would be assigned a serial number coded in such a way as to identify the school, courses of study, grades and years of attendance, etc. The leaver would keep this serial number for his working life, and his employer would be required to record it on all returns made on the annual enumeration. With this procedure the pre-employment school record of each employee with secondary education and above could be traced easily. Reports on post-school employment could be made to headmasters, career-masters, or university officials for all leavers. As information of this kind is accumulated each year, there would be a complete record for each individual of changes in occupation, pay, promotion, and transfer, i.e., a tracing of his career pathways. The information collected could also be used by research organizations for making cost-benefit studies, identifying major shifts in employment patterns, estimating manpower supply and demand, and developing materials for guidance purposes. This scheme, moreover, might eliminate the necessity of making periodic manpower surveys by substituting a procedure which in effect would be a continuous process of assessment of the market for middle and high level manpower in relationship to the educational system. There are, however, some drawbacks and knotty questions. The scheme is more appropriate for tracing the history of employment than experience with unemployment. The assignment of serial numbers and securing the compliance of employers in reporting serial numbers might pose some problems, and the reporting itself could infringe upon individual civil liberties. The analysis of the data might also create obstacles in newly developing countries, particularly if the system were extended to very large numbers of school leavers, i.e., if it were applied to all secondary school forms, dropouts, and/or all primary school leavers. Nevertheless, the possibilities of this system for building more effective linkages between school and work are so great that they warrant serious consideration in most countries.

The tracer study idea, of course, is not new. Follow-up studies of school leavers have been made for academic purposes by researchers. The employment status of recent graduates of the Dar es Salaam Technical College was surveyed in 1969, and the findings were used as a basis by planning authorities for revision of curriculum and entering salary scales for employed technicians. Several of the faculties at Haile Sellassie I University in Ethiopia have detailed records of the careers of their graduates. And many schoolmasters, without making formal studies, appear to have a very good idea of the employment status of their former students.

Tracer surveys, however, need to be generalized and systematized in most countries. A first step would be a requirement that every education and training institution, whether formal or non-formal, establish a simple system for tracing their "outputs" for a period of between 2 to 5 years. Placing of responsibility for tracing on the institution, in itself, would help to provide better linkages between school and job. External donors would suggest that such tracer mechanisms be included as one of the conditions for aid. The design of the tracer instrument would have to be quite simple and standardized (it would have to be kept free of extensive and detailed questions which social scientists might seek to insert!). A program for collection of the data from the training and educational institutions would need to be devised. And, in order to maximize the use of the data, arrangements should be made for research institutions in the universities and the ministries to have access to it. A comprehensive system for the automatic tracing of skilled and educated manpower, however, would probably be more useful for national development planning than any other source of data on human resources.

The drawbacks as well as the advantages of the tracer study scheme must be considered. It is more easily applied to manpower in the modern than in the intermediate and traditional sectors. Also, it provides information on past actions, not future estimates. Yet tracer studies would still give an indication of trends and also a system of "warning lights" which could provide as sound a basis for future estimates as any of the other techniques of manpower analysis.

Cost-benefit studies of returns to education

No listing of techniques for human resource assessments would be complete without mention of cost-benefit studies of economic rates of return to education. Preliminary studies of both individual and social returns associated with various levels of education have been made in Nigeria and Kenya, as well as in India, Colombia, and some other Latin American countries. So far they have attracted a great deal of attention from economists but have not as yet been used extensively as a basis for policy formulation.[18]

The methodology of the rate of return formulation, as summarized by Maureen Woodhall in her case study of Colombia, involves "a comparison of pre-tax earnings differentials and the total costs of education to society as a whole, (including expenditures on teachers, books, etc., the value of buildings and the production foregone by society because of the decision to educate students instead of enrolling them in the labor market)" giving "the social rate of return to education," and "a comparison of post-tax earnings differentials and the costs of education borne by the individual (including fees, expenditures on books and earnings foregone)" giving "the private rate of return."[19] The classic assumption made in dealing with this productive investment, hence the rationale for measuring the economic benefits of education to society by individual earnings differentials, is that labor's earnings represent its marginal product, determined by the free interaction of supply and demand. The cost-benefit approach, then, employs such empirical data as age-education-earnings profiles and annual earnings differentials in presenting the association between schooling and earnings used to estimate the returns to education.

There are many technical questions involved in the methodology of making cost-benefit analyses which we shall not dwell upon here. As far as African countries are concerned, however, there are two major shortcomings. First, no country has adequate statistics on earnings of persons with different levels of education, nor on the factors other than education, which might explain in part the earnings differentials. As indicated earlier, this deficiency could be remedied in time if tracer studies of school leavers were to be instituted on a comprehensive basis. The second and more serious drawback is the assumption that earnings of individuals reflect the productivity of individuals and their value to society. In the African countries, in particular, earnings of persons are determined more by institutional than by market forces, reflecting the salary and wage levels of the pre-independence era. The human resource approach, moreover, would not accept earnings as the sole, or even the most important, indicator of development and utilization of manpower. Employment status and the strategic nature of contributions to development, measured in terms other than income, would be given much greater consideration. Here again, the information provided by tracer studies would supply a means of determining the cost-effectiveness of various levels and types of education.

---

18. Maureen Woodhall, "The Use of Cost-Benefit Analysis to Compare the Rates of Return at Different Education Levels: A Case Study in Colombia," Paris: UNESCO, IIEP, March 7, 1969; T. W. Schultz, "Returns to Education in Bogota, Colombia," Santa Monica: The Rand Corporation, September 1968; Marcelo Selowsky, "The Effect of Unemployment as a Guide to Resource Allocation in Education: A Case Study on India," Paris: UNESCO, IIEP, June 20, 1969; Hans Heinrich Thias, "Cost-Benefit Analysis in Education: A Case Study on Kenya," Washington: IBRD, November 1969; Lucila Arrigazzi, "Evaluating the Expansion of a Vocational Training Programme: A Chilean Experience," Paris: UNESCO, IIEP, March 20, 1969; Samuel S. Bowles, *Planning Educational Systems for Economic Growth*, Cambridge: Harvard University Press, 1969.

19. Maureen Woodhall, *op. cit.*

Despite the shortcomings of cost-benefit studies, however, they can be useful, in combination with other surveys and techniques, in evaluating the efficiency and tasks of educational systems. They could also be useful, if appropriate tracer information was available, in determination of the effectiveness of a wide variety of non-formal education programs. Consequently, they deserve high priority in the building of research activity in the universities and other research organizations.

Manpower surveys, labor force enumerations, tracer studies, and cost-benefit analyses, in combination or by themselves, will provide only a small part of the information needed for continuing human resource assessment. Other high priority projects would be demographic and migration studies, analyses of labor absorptive capacity of a wide variety of industrial and commercial activities, case studies of experience with non-formal education both in urban and rural areas, and above all comparative cost-benefit studies of formal vocational schools, employer-operated training programs, village polytechnics, training pools, and other schemes for developing craft skills. These and many additional projects would be included in any comprehensive research agenda on human resources.

CONCLUSIONS AND IMPLICATIONS FOR HIGHER EDUCATION

The argument of this paper may now be summarized briefly. The growth, prosperity and viability of the new African nations will depend ultimately on their ability to develop systematically and to utilize effectively their human resources. A profile of the major human resource problems has been presented, the most critical being 1) rising unemployment in the urban areas; 2) under-employment of the rural masses and their inability to share in the development process; 3) shortages of stragetic skills in all sectors of African economies; 4) educational systems which are out-of-gear with national development needs; 5) the prospect of a future adverse "balance of brains"; and 6) excessively high and constantly rising rates of population growth. The required high priority strategies for human resource development and utilization are 1) labor-intensive employment generation in the urban areas; 2) raising incomes and productivity of small farmers and rural dwellers; 3) building skills of middle and high level manpower for modern sector as well as rural development; 4) better gearing of the system of formal education to the needs of national development; 5) maximizing the skill and knowledge generating capacity of "non-formal" education; and 6) maximum utilization in national development of the talents of growing numbers of Africans who are being given high level education and training at great public cost.

The "human resource approach" in building such strategies is a *perspective* from which to view national development policy, and as such is relevant but not subordinate to the perspective of increasing national income or GNP. While recognizing the importance of increasing the total material wealth of African nations, the human resource approach gives, in comparison with the strategy of increasing aggregate wealth as an end in itself, higher priority to the goals of full employment, more equitable income distribution as between the modern and traditional sectors and rural and urban populations, and relevant skill and knowledge development of the actual and potential labor force. The paramount goal of the human resource approach is to maximize the effective development and to promote the fullest possible utilization of persons who are or potentially will be engaged in the production of useful goods and vital services in the emerging African nations.

The techniques of human resource assessment range far beyond the traditional type of statistical surveys of high level manpower. They involve continuous enumeration of the labor force, tracing of career patterns of school leavers and university graduates, the study of labor-absorptive capacity of different industries and activities, the calculation of cost-effectiveness of investments in human resource development, and many other aspects of education and manpower utilization. Indeed, a human resource assessment is really an assessment of the entire national development process from the perspective of human aspirations and the welfare of a nation's people.

African universities are destined to play a central role in the development and utilization of human resources. In terms of the national wealth of African countries, they are the most expensive institutions of higher education in the world. Their potential contribution to national development is correspondingly very great, and many strategic questions can be raised for them.

The universities are major producers of high level manpower. Will they educate the kind of persons most needed for national development? Can they prepare people to spearhead rural transformation as well as to fill established positions in the modern sector enclaves? Can they turn out "prime movers of change" in addition to competent functionaries for the civil service?

The universities can become the centers for the research which is most relevant to national development. Can they mobilize and inspire the resources to assess development needs from a human resource perspective? Can they become generators of technologies geared to specific African needs as well as extendors and imitators of science and technology of the advanced countries? Can they seize the initiative in identifying the crucial problems of national development and laying out the avenues of approach to their solution?

The universities can energize Africa's most talented youth—present and future students—and involve them in the processes of national development. Can they utilize the services of students in research on critical issues both in rural and urban areas? Can they legitimate university education as preparation for national service as well as a system of entry passes to high paying and high status jobs? Can they broaden the communication between students and the people as well as create a technically educated elite?

And finally, the universities can be the principal instruments for molding, preserving, and articulating African culture and African ideals. Can they free themselves from the too close adherence to the standards, curriculum, orientation, and assumptions of higher education which they inherited from colonial regimes? Can they build new concepts and theories of economic, political, and social organization which have relevance to the African scene rather than to advanced capitalistic or socialistic economies? And can they build the base for African science and African engineering as well as for African humanism and idealism?

These are fundamental and challenging questions. As capstones of the educational pyramid, the universities will determine in large measure the orientation, mission, and effectiveness of all formal and non-formal education. In a subsequent paper, OLC will examine more closely the problems as well as the great potential of African universities in the seventies.