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The Manpower and Employment Aspects of Selected Experiences of Agricultural Development in Tropical Africa

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I. Introduction: the nature of the problem

IT IS NOW generally recognised that agriculture will for a long time have to absorb most of the available labour force in the less developed countries.[2] This is particularly true of tropical Africa, where the somewhat limited markets for manufactured products together with the application of modern methods of industrial production are likely to generate only slow increases in non-agricultural employment.[3]

The maximisation of employment on the land is not, however, always a conscious objective of development strategy. The primary emphasis has usually been on achieving the greatest possible increase in output, and this is not always reconcilable with maximum expansion of agricultural employment in the country as a whole. International and bilateral agencies financing agricultural development concentrate on the project approach, and in calculating the economic returns of projects they frequently regard labour as a cost of production. On occasion they

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[2] See, for instance, Werner Bauer and Michel E. A. Hervé: *Employment and industrialization in developing countries* (Center Paper No. 80, Yale University Economics Growth Center, New Haven, 1970); and Elliot J. Berg in *Wages and employment in less developed countries* (Center for Research and Economic Development, University of Michigan, Discussion Paper No. 13, OECD Conference on Unemployment, Montebello (Quebec)).

[3] Carl Eicher, Thomas Zallas, James Kocker, and Fred Winch: *Employment generation in African agriculture* (Institute of International Agriculture, Michigan State University, East Lansing (Michigan), July 1970).

do take into account the " opportunity cost " rather than the nominal market value of labour and when this happens they may even evaluate such opportunity cost at zero or close to zero. This is, however, still a long way from regarding the creation of additional opportunities for the employment of labour as a positive benefit. There may accordingly be a need, in appropriate circumstances, to take into account the " value added " by an agricultural project. Moreover, the project approach may lead to excessive emphasis on schemes with the highest rates of economic return. This would be a perfectly justifiable procedure if one could assume that rural populations were free to move both within a country and across the boundaries of countries to areas where the highest economic returns can be achieved. Unfortunately, such an assumption is hardly realistic. For the most part agricultural development must take place where people are settled, since opportunities for permanent migration are limited. In these circumstances the minimum rate of return required must vary in accordance with the opportunities available. If in any country projects with only the highest rates of return are accepted, this may well result in neglect of comparatively poor and yet populous agricultural regions and thus aggravate the pressures towards urban migration and urban unemployment.[1]

Complexity of the employment problem

It should be recognised from the outset that the agricultural employment problem is extremely complex. Many regions in Africa are characterised simultaneously by severe seasonal labour bottlenecks and by chronic underemployment of labour over most of the year. Complete rural unemployment does not, to my knowledge, exist to any significant degree. Seasonal labour bottlenecks and seasonal labour surpluses characterise particularly the savanna areas of Africa, where the rainfall pattern permits only a single cropping season and severely limits its duration. Labour requirements are therefore telescoped. Immediately following the advent of the rains, the land must be prepared and the crops planted, so that they can properly mature during the brief growing season. During this time all or virtually all of the available labour resources must be mobilised. Then, very soon after planting, there is a burgeoning of weeds, leading also to the full utilisation of labour for weeding. There may be another labour bottleneck during harvesting,

[1] In this connection it should be noted that recent investigations have shown that it becomes rational to migrate to urban areas even if there is only a 50 per cent or even a 33 per cent probability of obtaining a job, because urban wages are generally so much higher than agricultural wages. See J. R. Harris and M. P. Todaro: *A two sector model of migration with urban unemployment in developing countries*, Massachusetts Institute of Technology Working Paper No. 33 (Cambridge (Massachusetts), 1968), and " Migration, unemployment and development: a two-sector analysis ", in *American Economic Review* (Menasha (Wisconsin)), Vol. LX, No. 1, Mar. 1970, pp. 126-142, and Todaro's article below.

although in most cases harvesting can be stretched over a longer and more flexible period of time. During some parts of the agricultural season, however, and more particularly during the dry season, there is little or no work.

Under such conditions attention must be focused on cropping patterns and methods of production which will, on the one hand, avoid an aggravation of labour bottlenecks or facilitate their removal and, on the other, bring about fuller employment during more of the year and command higher incomes. It is idle, for example, to urge farmers to plant both their food crops and such cash crops as cotton early in the season even though agricultural research stations can demonstrate that yields increase in proportion to early planting. Farmers adjust their pattern of production and the timing of their farm operations to the availability of labour. They will generally concentrate first on planting food crops on which their basic livelihood depends and only afterwards on the crops which provide them with cash income.

Coping with seasonal labour bottlenecks

Seasonal labour constraints can be alleviated or removed in only three ways. One of these is through the development, with the help of agricultural research, of cropping patterns providing for the cultivation of crops taking different lengths of time to mature and making possible a better utilisation of labour. In the Bouaké region of the Ivory Coast, for example, the development and introduction of the shorter-maturing yet high-yielding Allon varieties of cotton have made possible the extensive cultivation of cotton during a period that does not conflict with the period of production of yams, the staple food, when labour is also in heavy demand.[1] Elsewhere the development of short-maturing varieties of ground-nuts has made it possible to plant this crop after food grains without a significant sacrifice of yields. Further agricultural research is necessary, however, to achieve improvements in the sequence of cropping such as will smooth out labour peaks and bring about a fuller utilisation of the available labour supply. For this purpose research will need to be oriented less towards specific crops and more towards the modification of farming systems as a whole.

The second method of dealing with labour constraints is through the introduction of appropriate implements and machinery. African farmers still work predominantly with a few simple hand tools—the hoe, the axe and the cutlass. This obviously limits the productivity of labour as well as the amount of land which can be tilled and utilised for cash crops as well as for subsistence. The proper equipment of African

[1] J. C. de Wilde *et al.*: *Experiences with agricultural development in tropical Africa* (Baltimore, The Johns Hopkins Press, 1967), Vol. II, pp. 408-410.

agriculture remains to a large extent an unresolved problem.[1] New implements which have been introduced have often been ill-adapted to the farmers' requirements. There have been many ill-starred ventures involving tractor cultivation, and the experience with them has not been analysed sufficiently to indicate more precisely under what conditions it is feasible to employ tractor-drawn implements in an economic fashion. The wider use of animal-drawn implements has also been beset by many problems, particularly those relating to the proper feeding and care of draught animals and the training of both men and animals in methods of cultivation using animal traction. Yet experience shows that equipment can be used effectively to alleviate labour bottlenecks. For example, in the case of the Office du Niger irrigation scheme in Mali, the use of tractors for ridging in the dry season before water becomes available has facilitated earlier planting of cotton. The same is true of the Gezira irrigated cotton-growing scheme in the Sudan. In the case of the Mwea Tebere rice-growing project in Kenya the introduction of tractor-mounted rotavators has made it possible not only to put the land in optimum condition for the growing of rice through a single operation but, above all, greatly to improve the timing of the cultivation. In the savanna areas of west Africa the introduction of animal-drawn ploughs and cultivators has often permitted quicker preparation of land and assisted in improving the sequence of operations. While the role of the plough has sometimes been greater in extending the area under cultivation than in bringing about earlier planting, the expansion of the cultivated area has often been beneficial in that it has made available more land for cash crops and to the extent that the mechanisation of land preparation has made it possible not to aggravate seriously labour bottlenecks such as those caused by weeding. In Mali, for example, cotton cultivation has been considerably facilitated by the use of animal-drawn ploughs. In certain areas, such as the Bokoro region of Chad, it was also found that the use of an animal-drawn cultivator for land preparation, followed by the employment of a seed drill, enabled farmers to plant ground-nuts despite a simultaneous demand for labour for the weeding of previously planted millet.

The third method of overcoming seasonal labour shortages is by supplementing the family labour supply [2] with hired labour. Such labour may come both from within the region where agricultural development is taking place and from other regions where there is a surplus of manpower in relation to profitable employment opportunities. Agricultural

[1] See de Wilde *et al.*, op. cit., Vol. I, Ch. 6: " Implements and machinery ".

[2] It may be remarked here that the full utilisation of family labour is often still impeded by the traditional division of tasks between men and women. Women, who are traditionally responsible for cultivating food crops, for assisting men in the cultivation of cash crops and for discharging manifold household duties, are frequently overburdened while men are comparatively unoccupied.

innovations which raise production and create an additional demand for labour tend to be adopted initially by a relatively small percentage of " progressive " farmers. Many farmers fail to introduce improved methods of production or to engage in the cultivation of new crops either because they are very conservative and disinclined to take risks or because, under some conditions, they suffer from a shortage of land. The successful innovators who are increasing their cash income therefore find it possible to draw on the less progressive and poorer farm families for wage labour. Thus in the highlands of Kenya the larger farmers who are successfully growing such crops as coffee and tea and practising modern dairy-farming have had access to the labour resources of the smaller farmers, many of whom do not have enough land to till. However, as agricultural progress becomes more generalised, the labour resources available within the region tend to become a constraining factor. To the extent that a further increase in output depends upon additional labour supplies, what matters is the availability of migrant workers from other areas within the country or even from outside the country. Many cases can be cited where migrant workers from poorly endowed agricultural regions have greatly facilitated the expansion of cash crops in the richer agricultural areas. For instance, cotton production in the Gezira is heavily dependent as regards sowing, weeding and particularly picking on a large supply of migratory labour from the less favoured regions of the Sudan and also from such relatively distant areas as north-eastern Nigeria, the Central African Republic and Chad. In Uganda the early development of cotton and robusta coffee production owes much to the availability of migrant labour from Rwanda and Burundi. The rapid expansion of cocoa and coffee production in the Ivory Coast and of cocoa cultivation in Ghana and Nigeria would have been impossible without the help of migrant workers from the northern parts of these countries as well as from Upper Volta and (in the case of the Ivory Coast) Mali. The extent to which current projects for the rehabilitation and improvement of cocoa and coffee production in the Ivory Coast and of cocoa cultivation in Ghana will be successful depends largely on the continued adequate supply of migrant workers, particularly since the rehabilitation process will entail an additional demand for manpower.

Varying population pressures on land

The complexity of the employment problem in African agriculture is due not only to the coexistence of seasonal labour bottlenecks and underemployment but also to the large variations in the degree of population pressure on the land. Existing patterns of settlement and differing demographic pressures are the result of historical circumstances. Because of past population movements, tribes and even clans and lineage groups within tribes have been able to establish paramount claims to land, and

this tends to perpetuate large disparities in the amount and quality of land available. Some tribes and groups have more than enough land; others are crowded by historical accident into limited areas and have to struggle to maintain a bare subsistence. The " local sovereignties " over land often seriously inhibit more efficient utilisation of land resources and a more equitable distribution of land in relation to population. In some cases, to be sure, the people suffering from an increasing shortage of land have managed to meet the resulting pressures by progressively intensifying cultivation. This is true, for instance, of the Kara on Ukara Island in Lake Victoria, the Chagga on the slopes of Mount Kilimanjaro in Tanzania, and the Gishu and the Kiga in the mountain regions of Uganda. However, experience has shown that adoption of most of the intensive practices involved—such as terracing, cutting and storage of fodder, stall-feeding of cattle and the use of compost and manure—can at best stabilise incomes at a very low level unless this approach is accompanied by the cultivation of a profitable cash crop, such as coffee among the Chagga and the Gishu.

Some African governments have tried to deal with " local sovereignties " over land by formally nationalising unoccupied land. In practice, however, such a measure is difficult to enforce as long as tribal rights and loyalties can be effectively asserted against national rights and loyalties. Tribal claims to land are likely to be broken down only gradually, as African countries progress towards true nationhood. Meanwhile, they must be recognised as constituting a real constraint on agricultural development. They will impede but may not altogether prevent resettlement aimed at providing some relief for areas with excessive population pressure. In Kenya it has not in practice been possible to use the approximately 1 million acres of land purchased from European settlers exclusively for the settlement of African farmers from those tribal areas experiencing the most serious demographic pressures. The purchased land has had to be apportioned among tribes in accordance with established zones of influence, and this has meant in many cases the allocation of additional land to people who had relatively little need for it and little incentive to cultivate it intensively. The paramount national interest constituted by the utilisation of this land reform measure for maximising employment on the land and relieving population pressure thus had to be partially sacrificed to practical politics. In Upper Volta the central Mossi plateau, characterised by poor soils and declining soil fertility, remains seriously overpopulated, while other tribal areas are relatively underpopulated. The Mossis have been driven by necessity to infiltrate to some extent other tribal areas on their periphery, but for the most part they remain there as " guests " without permanent rights, and the other tribes involved are likely to restrict such migration as soon as the Mossis threaten to become sufficiently numerous to contest the absolute control of any of their lands. Thus the principal demographic " safety valve "

of the Mossi plateau continues to be temporary labour migration to the Ivory Coast and Ghana, particularly since ecological conditions on the plateau are singularly unfavourable for the introduction of remunerative cash crops which would more adequately support the existing population.

The variations in population pressure on available agricultural resources have important implications for the approach to development. Where people do not consider the availability of land to be a limiting factor on their output, their concern is to maximise the return to labour rather than to the land; and this often remains the primary consideration even after the shortage of land has become a serious constraint according to objective criteria. In such conditions efforts to raise yields per unit of area by intensification, i.e. by greater inputs of labour or other means of production, may well be resisted. This is not to say that an increase in yields cannot in many cases be reconciled with the objective of maximising the return to labour. Instances can also be cited, however, where " extensive " cultivation practices have proved more remunerative and attractive to farmers than the more intensive practices.[1]

The availability of manpower has been a particularly crucial determinant of the success of irrigation schemes in Africa. The substantial investment required for such projects is seldom justified unless high yields per unit of area can be obtained. This entails a rather high density of settlement and/or access to outside labour supplies. The comparative lack of success of the Office du Niger irrigation scheme was undoubtedly due to a variety of factors. One of the most important, however, was the inability to settle in the area a sufficient number of cultivators. The surrounding lightly populated areas provided an inadequate reservoir of settlers, and part of the tenants under the scheme had to be in effect conscripted from among the Voltaics. The rather low level of net income achieved was not conducive to the attraction of more Mali tenants, particularly after cotton was successfully introduced in the rain-fed areas and provided Mali farmers with a good source of cash income. Nor was it possible in these circumstances to recruit much paid labour to supplement the manpower resources constituted by the tenants. The Gezira scheme, on the other hand, proved much more successful. While the land allocations under this scheme considerably exceeded the capacity of the tenants to manage them with their own family labour, the tenants were able to earn higher net incomes and could both find and pay for necessary additional labour from the poorer neighbouring areas. An even sharper contrast is afforded by the success of the Mwea Tebere scheme in Kenya. This scheme was located in a densely populated zone where it proved possible to find not only an adequate number of tenants but also the paid labour needed at the time of the transplanting and harvesting of rice.

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[1] For some examples, see de Wilde *et al.*, op. cit., Vol. I, pp. 74-77.

If in accordance with projected requirements most of the population increase must be provided with a livelihood in the rural areas, efforts must be made in two principal directions. First of all, a broad programme is needed to keep people on the land and increase attractive employment opportunities in the rural areas through the modification of educational systems, the expansion of the production of profitable cash crops, the improvement of rural amenities and the quality of rural life, and the diversification of activities. Secondly, there must be a more particular effort to improve the opportunities of the inhabitants of the poorer and overcrowded areas, either by greater concentration on the development of these areas or through the provision of facilities for resettlement. The various aspects of this dual approach will now be considered.

II. Keeping people on the land

Reform of rural education

The prevailing system of education is often accused, and quite rightly, of alienating people from their rural environment. The type of schooling offered tends to facilitate and encourage an exodus from the rural areas to the cities. Unfortunately no very satisfactory way of providing an education better adapted to rural requirements and calculated to encourage people to take advantage of employment opportunities in the rural environment has yet been devised.

One of the more interesting alternatives to normal primary education are the centres for rural education established during recent years in Upper Volta. By 1969-70 about 28,000 boys and girls were enrolled in these centres, which are intended as a replacement for formal primary education. They take boys and girls from 13 to 15 years of age and provide them with three years' instruction that in theory would qualify them to take up farming careers. Although some basic academic education is provided, the principal emphasis is on practical training—agriculture and associated rural crafts for the boys, and agriculture, child rearing, hygiene and home economics for the girls. On leaving the centres the boys are intended in principle to obtain land to start farming in accordance with improved techniques.

While the underlying concept seems sound, the centres have in practice largely failed to live up to the original expectations. First, both the parents and pupils have tended to consider the centres as an inferior substitute for primary education and increasingly pressed the Government to make them more like primary schools. Second, boys leaving the centres between 16 and 18 years of age have often been unable to obtain land for farming, since under the prevailing custom young men are not normally allotted land until they get married. To meet this problem the

Government has organised a number of co-operative farms and established supplementary post-school training centres, but neither have these measures been conspicuously successful. Consequently many of the boys have migrated to the Ivory Coast. Third, the teachers at the centres have not for the most part been sufficiently trained, particularly in the practical subjects of the curriculum. Finally, the farms attached to the centres have not been large enough or sufficiently well-equipped to provide a real training ground for practical farmers. Despite their deficiencies, the rural education centres appear to reflect a sound approach and to be capable of improvement. Greater efforts are needed to explain their objectives to parents and to enlist the latter's co-operation. The pedagogic training of the teachers could be improved and better facilities provided for practical farm work. Arrangements for close collaboration between the centres and the agricultural extension service could help to make the instruction more practical and to integrate those leaving the centres into rural life.

The role of commercial farming

Other experiments with the reform of rural education could probably be cited. In the last analysis, however, their effectiveness depends in large part on the possibility of providing attractive employment opportunities in the rural areas. The development of commercial farming capable of furnishing incomes in line with the rising aspirations of the younger generation is thus of crucial importance. In the past, considerable success has been achieved through the introduction and expansion of a wide variety of cash crops including arabic and robusta coffee, cocoa, tea, oil palms, cotton and ground-nuts. In limited areas where ecological conditions have been particularly favourable, as in the highlands of Kenya, a profitable dairy industry has been developed. Bilateral and multilateral aid has greatly facilitated the development of commercial farming. The International Bank for Reconstruction and Development (IBRD) and the Commonwealth Development Corporation, for example, have participated prominently in the development of tea production in Kenya and Uganda [1] by establishing an integrated programme to this end, including credits for training in tea cultivation and picking, the building of roads and the provision of other facilities for the collection of tea, and the setting up of tea factories. In the savanna areas of west Africa, French bilateral aid, the European Development Fund and, more recently, the IBRD have financed a substantial expansion of cotton growing, which has created a new source of cash income for thousands

[1] In 1971 the IBRD's affiliate, the International Development Association, also provided a credit for tea development in Mauritius. This project, which will create permanent employment for 4,000 persons, is particularly important for this island, which is extremely densely populated.

of farmers. Other projects have been concerned with the expansion and rehabilitation of oil palms, cocoa production and rubber plantations (e.g. in Dahomey, Ghana and the Ivory Coast).

The increase in wage employment in agriculture

Farming for cash has not only benefited the farmers themselves but also generated a considerable demand for paid labour, albeit at rather low levels of remuneration. This has happened not just because the cultivation and harvesting of cash crops require more labour. It is also a reflection of the fact that the income elasticity of demand for labour among African farmers is high. Once farmers experience a considerable increase in income, they prefer to spend part of this increase on labour in order to purchase for themselves more leisure or opportunities to engage in other occupations. In Kenya land consolidation and the related development of cash crops and dairy farming have brought about a

PROPORTION OF CASH INPUTS ALLOCATED TO LABOUR

Area	%
Northern Katina, Nigeria (ground-nuts):	
Farmers with ploughs	65
Farmers without ploughs	65
Akim Abuakwa, Ghana (cocoa)	86
Mazabuka District, Zambia (maize):	
Progressive farmers	10
Teso District, Uganda (cotton and ground-nuts)	67
Kisii District, Kenya (coffee, tea, pyrethrum):	
Progressive farmers	69
Other farmers	58
Geta District, Tanzania (cotton)	73

Source: Food Research Institute, Stanford University: "Economic, cultural and technical determinants of agricultural change in tropical Africa", Preliminary Reports 2 to 6 and 8 (Xeroxed, 1969).

substantial increase in employment [1] and helped to arrest the rising tide of migration to the cities. Surveys undertaken by the Farm Economic Survey Unit and others in Kenya have stressed the large labour inputs involved in many of these commercial farming activities.[2] As already

[1] See Eric S. Clayton: "Agrarian reform, agricultural planning and employment in Kenya", in *International Labour Review*, Vol. 102, No. 5, Nov. 1970, pp. 431-453.

[2] On this aspect see the case study "The experience in Nyeri District", in de Wilde *et al.*, op. cit., Vol. III, Ch. 2.

noted, the development of coffee, cocoa and palm oil production in the Ivory Coast and of cocoa production in Ghana has been of great indirect benefit to Upper Volta by providing employment for several hundred thousands of Voltaics. In the Sudan the Gezira scheme, which has been expanded with IBRD financing, provides part-time employment for 300,000 or more workers annually.

Studies of experiences with agricultural development in a series of selected areas carried out under the auspices of the Stanford University Food Research Institute have illustrated once more the tendency of farmers in developing areas to allocate a significant portion of their cash outlays to labour. The table provides the relevant information on this subject as obtained in interviews with a presumably representative number of farmers. It is significant that the only area surveyed by the Food Research Institute where there were virtually no cash outlays on labour was Bawku District in Northern Ghana. There, the failure to devise practical and profitable innovations in agriculture meant that the necessary cash income was not generated.

Evaluation of efforts to promote commercial farming

It must be conceded that commercial farming in tropical Africa is far from being a universal phenomenon. Only a minority of farmers engage in it and then in many cases only as an ancillary or supplementary activity to subsistence cultivation. Yields, particularly on annual crops, are still low. There is a considerable lag in the introduction of fertilisers, insecticides and fungicides and in the adoption of improved seed and cultivation practices which would help to raise productivity. Much further progress should be possible with the help of agricultural research, more effective extension and credit services, improvements in transport and appropriate pricing policies. More agricultural research should be devoted particularly to means of raising the yields of subsistence food crops so that more land can be spared for cash cropping and so that grain surpluses can eventually become available for feeding livestock, which is now inadequately nourished. Studies to evaluate the reasons for success or failure in introducing innovations should be multiplied. In many cases where little or inadequate progress has been achieved, there is a need to acquire a fuller understanding of the prevailing farming systems that have to be modified and of the factors which constrain farmers to adhere to them. These may include ecological considerations, the availability of land, manpower and implements, the structure of society and its sense of values and networks of social obligations, markets and prices and the availability of transport and government services. It is vital to identify the critical constraints and to determine to what degree they are susceptible of modification by appropriate measures. Without understanding why farmers and livestock breeders adhere to

certain practices and cropping systems we cannot devise and secure the adoption of innovations which are considered by producers to be both feasible and profitable. Although existing and traditional farming patterns have been studied much more in recent years than heretofore, our knowledge of them, particularly considering the wide variety of conditions in Africa, is still far from complete. Even where these patterns are known, the curricula of agricultural schools often pay no attention to them; and agricultural officers and farm-level extension workers are sent out without fully understanding what farming systems they are expected to modify and why. There is a need to put more emphasis in the curricula of agricultural schools at all levels on a knowledge of the whole milieu in which the farmer operates. Ways and means of retraining agricultural officers and extension workers should be explored and opportunities created to enable such personnel to assist in adapting curricula to meet the practical problems encountered in the field.

Alleviation of farm drudgery

Life in rural areas can also be made more attractive and supportable in a number of other ways. For many farmers dependent on the hoe and axe agriculture means a " grubby ", unattractive occupation. The younger generation, which has enjoyed some measure of formal education, seeks largely to escape from it. Consequently the introduction of implements and machinery which take some of the drudgery out of farming assumes increasing importance. It has already been noted that types of equipment which would be both economic and practical under African conditions are by no means easy to find. The use of equipment which simply alleviates labour burdens without significantly contributing to production can hardly be defended.

Improving rural amenities

Improvement of the amenities of rural areas also presents a challenge. The provision of safe and convenient supplies of drinking water, of better health facilities, of social centres and of improved housing can play a significant role in making rural life more attractive. The installation of articulated water systems in some of the wealthier and rather densely populated areas of Kenya has proved a considerable boon to the population concerned; and in a number of countries, including Upper Volta, extensive programmes for the digging of wells have aroused sufficient popular support to result in a considerable contribution of free labour on the part of the local population. In the Ivory Coast substantial efforts are being made to improve the standards of rural housing. In Togo the Housing and Building Centre established in 1969 and financed by the United Nations Development Programme (UNDP) has launched a

broad programme for the development of model low-cost housing utilising cheap native materials and for the training of building entrepreneurs and workers. The Centre plans eventually also to foster the creation of co-operatives for the financing of rural housing.

It can be argued that investments in social welfare should be made with great caution so as to avoid the creation of facilities and standards which cannot be supported by the " production base " of the local economy. While concern with this problem is justified, it can be exaggerated. Investment in a pure water supply and in health facilities may make an important indirect contribution to productivity by eradicating or reducing the incidence of debilitating diseases such as Guinea worm, malaria, schistosomiasis and onchocerciasis which curtail the productive capacity of the people affected. Moreover, some subsidising of investment in social welfare in the rural areas may well be justified if the amenities provided help to avert migration to the cities. Investment in similar social infrastructure and facilities in the urban areas is likely to prove more expensive.

Diversification of rural production

The diversification of the rural economy has been increasingly emphasised as another method of creating additional employment opportunities in rural areas. It is usually promoted, consciously or unconsciously, as part of a broad integrated approach to rural development comprising the improvement of agriculture, the provision of rural amenities, a measure of " rural industrialisation " and the related adaptation of rural education. Typical of this approach is the Pilot Project for Rural Employment Promotion started late in 1969 in a small area of Western Nigeria with UNDP financing and the help of personnel of the International Labour Office and the Food and Agriculture Organisation. This project focuses more or less simultaneously on improvements in local agriculture, the provision of feeder roads, the training and promotion of local craftsmen and entrepreneurs and pre-vocational training. In Kenya plans for the development of rural industry through rural industrial centres and small rural industrial estates are being drawn up.

It is important to explore carefully the possibilities for and limits to rural industrialisation. It is by no means easy to find economic and feasible projects. While there may be additional opportunities for the processing of local agricultural and livestock products and locally available raw materials, such processes as cotton ginning, coffee hulling and palm fruit oil extraction have already been developed as an indispensable corollary of efforts to expand the production of the commodities concerned. The establishment in rural areas of undertakings producing for a wide market, including the major urban areas of the country, is often not economically viable. Market-oriented industries are more

economically located in or near their major market areas, which means in or close to the cities where purchasing power is concentrated and where such amenities as power and water, as well as skilled labour, are likely to be more readily available. Rural handicraft or quasi-industrial undertakings which have been enabled to develop a level of production in excess of the requirements of the local market may well be tempted to move their operations to the cities, which afford a larger market for their products. On the other hand, as and when agriculture becomes more prosperous and local purchasing power increases, there will be opportunities for the development of trade and commerce in consumer goods and farmers' production requisites and for the setting up of undertakings producing a range of goods and services particularly tailored to the needs of the growing rural market. Undertakings producing building materials and engaged in contracting, as well as woodworking and metalworking establishments, may be especially necessary. While, as already noted, agricultural mechanisation has in many respects made but slow progress, there are areas in Africa utilising various types of equipment, including tractors, ploughs, cultivators, sprayers and dusters, ground-nut shellers, etc. Under existing conditions much of this equipment is poorly maintained and is often wastefully discarded before its normal useful life is exhausted. Proper repair and maintenance services are accordingly an acute need in many areas.

Training for rural crafts and industries

The above remarks highlight the problem of providing proper training for rural craftsmen and entrepreneurs. A number of efforts have been made in this respect. In Kenya, for example, the Christian Churches, supported by the Government, have set up so-called " village polytechnics " for training primary school leavers in various crafts.[1] The first of these was established in 1966 and there were seventeen in operation by early 1971. The polytechnics have very modest operating budgets and appear to rely largely on a volunteer teaching staff. The emphasis in the two-year training course is entirely on hand-work and no attempt is made to qualify trainees for certificates or the passing of trade tests. The objective is to train people who will be self-employed. Difficulties have been encountered in getting sufficiently qualified staff, and consideration is now being given to the establishment of a staff training centre. It is evident also that insufficient attention has been paid to the selection of crafts which are in demand in given rural areas and in which training should accordingly be provided.

[1] See also Walter Elkan: " Out-of-school education and training for primary-school leavers in rural Kenya: a proposal ", in *International Labour Review*, Vol. 104, No. 3, Sep. 1971, pp. 208-210.

The ILO has also been actively engaged in training programmes of the kind required. Apart from the above-mentioned Pilot Project for Rural Employment Promotion in Nigeria, it has, for example, implemented projects aimed at providing advice and guidance in the training of rural craftsmen in Senegal and Upper Volta and focusing on the training of teachers. Such schemes respond in principle to a real need. Unfortunately, however, they are not very spectacular and thus often fail to obtain constant and vigorous governmental support. Experience also indicates that training alone is not enough. It must be complemented by assistance to craftsmen to install themselves and particularly by facilities to enable them to acquire the equipment they need but cannot make or be trained to make themselves. It must be recognised also that in many of the rural areas of Africa craftsmen cannot as yet find sufficient remunerative work to support themselves solely by practising their trade. They often need to engage also in farming. Some type of combined training in agriculture and crafts may be appropriate under such conditions.

III. The approach to development in the poorer areas

I have already commented on the disparities in the availability of natural resources in various areas of Africa and on the constraints which prevent a more equitable distribution of the population in relation to those resources. There are accordingly enormous differences in the rate of development. The inhabitants of the well-endowed forest areas of the Ivory Coast have experienced a rapid rise in incomes; those in the northern part of this country and in most of Upper Volta have been left far behind. This situation is characteristic of much of Africa. For the poor and overpopulated areas the only palliative in many cases is labour migration. But however important labour migration may be as a means of supplementing meagre local incomes, it can hardly provide a solution to the problem. While, for instance, Voltaics may still find employment in Ivory Coast agriculture, there is already evidence of considerable resistance in the cities to migrant workers. In Ghana steps have been taken to reduce the employment of foreign labour. For the countries and areas providing the migrant workers, such migration is by no means an unmixed blessing. Not only does it create social problems through the disruption of family ties but, above all, it deprives areas of the most able-bodied and vigorous men, thus handicapping the effective implementation of development projects which could in the future reduce the need for migration.

What then can be done for these poorer areas? A few prerequisites for their development may first be mentioned. To begin with, bilateral and multilateral financing agencies should exercise discrimination in determining the minimum rates of economic return acceptable for pro-

jects. The required rate of return simply must be lower for the less promising areas. Then there should be somewhat greater flexibility in determining the ecological conditions under which various types of crops may be promoted. Technical agricultural experts tend, not unnaturally, to urge that a particular crop should be grown only where these conditions will result in the highest yields. However, in some circumstances it may be desirable to promote the cultivation of a given crop even under less than optimum conditions where farmers do not have a more attractive alternative. In such circumstances the farmers concerned may well be willing to accept a lower return for their labour than their counterparts in more favoured regions where other options are available. Thus opportunity costs of production should be the determinant in selecting areas where particular crops can be developed.

Above all, every attempt should be made to explore whatever development opportunities may exist in the less favoured areas which nevertheless must support large populations. In the savanna cropping areas more emphasis should be placed on the development of higher yielding sorghums and millets so that a large portion of these grains can be marketed (whether for food or fodder) and some portion may become available for on-farm fattening of cattle. In Upper Volta the financial assistance provided by the French Government and, more recently, the World Bank Group has been of great help in achieving the expansion of cotton cultivation, although unfortunately the best conditions for cotton growing exist for the most part in the less densely populated areas of the country. There are, however, opportunities for the development of small irrigated rice schemes in the poorer areas. In Malawi, which has a large population relative to its resources and where people have long been compelled to seek a cash income through migration, the World Bank Group is financing two projects for the development of the Shire Valley and the Lilongwe Plain in the central region which appear to be promising. The Lilongwe scheme provides for a rather comprehensive approach to agricultural development and will eventually affect some 76,000 farm families with holdings totalling about a million acres. Included in the programme are the development of land use and conservation plans and works, the provision of roads, water supplies and markets, the registration of land, progressive increases in the planting of synthetic and hybrid maize instead of the low-yielding indigenous varieties, improvement of tobacco yields and the stall-feeding of cattle. While the limited experience with this project does not yet permit a definitive judgment, the preliminary evidence indicates that it will significantly enhance the attractiveness of farming in this area.

Another approach is to resettle people from overpopulated areas. While we have already noted that " local sovereignties " over land often interpose serious obstacles to the transfer of populations, this is not always the case. For example, the Sakuma in the Lake Victoria region

of Tanzania have been able to escape population pressures by progressively moving westward into virtually unoccupied areas. In Upper Volta this opportunity is not available to the Mossis to the same degree. Even there, however, there appear to be possibilities for facilitating the progressive movement of part of the Mossi population into the comparatively unpopulated region of Fada N'Gourma in the south-east. In Senegal the World Bank Group has recently undertaken to finance a pilot project designed to resettle some of the people from the densely populated ground-nut basin in the new lands *(terres neuves)* of eastern Senegal. This is a small-scale project but it may serve to demonstrate the feasibility of resettling larger numbers of people, particularly through spontaneous migration once the basic infrastructure of the new region has been developed.

Other opportunities for resettlement may be created through the reclaiming and development of insalubrious areas. In the savanna areas of west Africa, for example, the prevalence of onchocerciasis, or river-blindness, which is transmitted by a black fly breeding in the foamy waters of rivers, has been an important factor in driving the population out of the river valleys affected. In such valleys the land is often more fertile than in the higher areas. A pilot programme for the eradication of the vector through the treatment of its breeding sites with insecticides has been conducted for some years, with the help of financing from the European Development Fund, in an area comprising parts of south-eastern Mali, south-western Upper Volta and the northern region of the Ivory Coast. This project has already demonstrated the possibility of controlling the vector and provided evidence that people will move spontaneously into the reclaimed areas. The World Health Organisation, in co-operation with other agencies, began in 1971 a year's study with a view to launching a more comprehensive campaign against the disease. Simultaneously the French Government is financing a feasibility study on the development, with a view to population resettlement there, of the White Volta River Valley in Upper Volta which promises, once the vector of onchocerciasis has been eradicated, to provide some relief for the hard-pressed population in contiguous areas inhabited by the Mossi and Bissa peoples. A comprehensive campaign against the vector could also alleviate pressures in pockets of excessive population in northern Ghana and the Korhogo district of the Ivory Coast.

It must be conceded, however, that resettlement opportunities are limited in relation to the overpopulation problem characterising certain parts of Africa. Experience also shows that resettlement often entails excessively heavy investment unless the primary emphasis is placed on spontaneous resettlement assisted to some extent by the provision of absolutely necessary infrastructure. In some cases, too, sociological problems impede the resettlement of populations far from their ancestral homesteads.

IV. Some conclusions

On the basis of the preceding analysis and previous experience of tropical Africa, the following points can be emphasised:

(1) Employment opportunities in the rural areas must be multiplied so that these areas can accommodate during the discernible future the major increase occurring in the labour force.

(2) Approaches to the rural employment problem must take into account the existence in many areas of both seasonal labour shortages and seasonal labour surpluses. There must accordingly be a co-ordinated effort to alleviate labour bottlenecks, provide fuller employment throughout the season and create additional attractive employment opportunities.

(3) Commercial farming in Africa has made considerable progress in recent decades and has not only provided attractive sources of cash income but generated a considerable increase in wage employment. More attention, however, must be paid to the various types of constraints which still prevent many farmers from introducing new crops and adopting new cultivation practices. To identify and deal with these constraints, a better knowledge of prevailing farming patterns must be acquired and disseminated among agricultural officers and extension workers who are supposed to modify these patterns.

(4) Practical reforms of rural education are necessary if the tide of migration to the cities is to be arrested. Existing experiments in this field should be evaluated with a view to their improvement where necessary, and every effort should be made to develop new and imaginative approaches.

(5) Living conditions in the rural areas must be made more attractive by relieving some of the drudgery of farming through judicious introduction of implements and machinery and by making better provision for rural health, housing and water supply, which can incidentally enhance labour productivity and obviate the need for even more costly investment in infrastructure and services necessary to accommodate rural migrants in the cities.

(6) Additional employment opportunities ancillary to agricultural development must be created in the rural areas. While large-scale rural industrialisation is hardly feasible, there are possibilities for the development of undertakings providing services and goods tailored to the needs of growing local markets. In this context the training of rural craftsmen and entrepreneurs and the implementation of measures to help them to establish themselves and to obtain the necessary equipment are particularly important.

(7) Special efforts are necessary to cope with the problems of the poorer agricultural regions which have considerable populations to support but which have largely been left out of the mainstream of development. These efforts must proceed from a realisation that lower rates of economic return must be accepted for projects in such regions and that the opportunity costs of production are low in view of the limited alternatives. They will need to focus also on the possibilities of resettlement. In this connection attention will have to be paid to the obstacles to population transfers and to the possibility of progressively attenuating " local sovereignties " over land.