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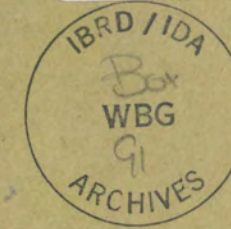
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November 6, 1972

AGRICULTURE AND DOMESTIC MANUFACTURING:
SOME AFRICAN EXPERIENCES

by Godwin E. Okurume*



In discussing interrelationships between agriculture and manufacturing, it is useful to distinguish between agro-industries that produce inputs for agriculture and those that use agricultural produce as inputs. Few agro-industries in Africa fall in the first category. The majority are engaged in agricultural processing.

I shall therefore base my remarks on experiences with agricultural processing industries, particularly in East Africa, since the concern of other members of the panel is West Africa. We shall see, however, that improvements in the interrelationships between agriculture and domestic manufacturing will benefit not only agricultural processing industries but also industries producing intermediate goods for agriculture.

The Landscape

Inadequate effective demand for agricultural inputs appears to be the primary explanation for the almost complete absence of input producing agro-industries. Farms are generally too small and often too fragmented for a farmer

* Dr. Okurume is an economist in the Western Africa Regional Office of the World Bank (IBRD). These remarks were prepared for a panel discussion on "Interrelationships Between Agricultural Strategies and the Growth of Local Manufacturing" at the Annual Meeting of the African Studies Association in Philadelphia, November 8-11, 1972. The views expressed are personal and do not necessarily reflect those of the World Bank.

to employ a tractor efficiently. Where unused arable land is abundant, a farmer who could increase total output by putting more land under crops, may not be responsive to exhortations to use fertilizer unless the fertilizer is free. More importantly, farmers producing for the home market are often unable to convert agricultural produce into other goods and services that they would like to consume. The reason is that, given the typically small size of the non-farm population and poorly developed infrastructure and marketing facilities, farmers could easily glut the market or might be unable to get the additional produce to consumers.

There is therefore little incentive for these farmers to purchase agricultural inputs. Intermediate goods, such as pesticides, are more widely used on export crops, but total quantity demanded, as in the case of producers for the home market, is often too small to justify domestic manufacture.

There are other reasons, which are equally applicable to agricultural processing industries and other manufacturing subsectors. Financing is probably the most important of these. African businesses are generally small and tend to die with their owners. Accordingly, in addition to the relatively high cost of administering loans to small businesses, financial institutions consider these businesses highly risky. African businessmen are, as a result, frequently constrained to rely primarily on limited personal and family finances for their investments.

To a large extent the credit problems of African businessmen reflect the traditional prudence and conservatism of bankers. The needs of development often call for credit policies that are unlikely to be acceptable to private bankers. It would thus seem that in countries where the banking system is dominated by branches of expatriate banks or where credit policies are otherwise controlled by outsiders who have no real stake in the development of the economy, the situation would be difficult to improve.

In the face of these financial constraints, African businessmen are often unable to go into manufacturing. When they do, they operate at sub-optimal sizes and high unit costs. These high costs are further augmented by the scarcity of skilled manpower, particularly managerial and technical personnel. The high cost structures of African manufacturing firms has meant that few of them can export and most are oriented toward the domestic market, which is typically small. Many might not be able to compete with imports, even in the absence of dumping problems, and operate behind high protective tariffs that tend to encourage inefficiency and high production costs. Accordingly, the scope for industrial expansion is limited to the pace set by domestic demand.

East African Experiences

In East Africa, as elsewhere in Africa, import substitution in consumer goods has been the cornerstone of manufacturing activities, including agricultural processing. The possibility of producing for export does not appear to have received adequate attention. Since the major cities are the final destination of most imports, the need for import substituting industries to locate near their product markets has resulted in the concentration of manufacturing industries in only a few areas in East Africa. In Kenya, the Nairobi metropolitan area alone accounts for nearly 50 percent of all manufacturing establishments, total employment and gross production. In Uganda, nearly all the industries are located in Buganda and the Eastern Region, with Kampala and Jinja alone accounting for about a third of all establishments, gross production and total employment in manufacturing. Similarly, 40 percent of Tanzania's manufacturing establishments and employees are to be found in Dar es Salaam.

To the extent that the major cities thus offer most of the opportunities for economic advancement, the geographical concentration of industries acts as a magnet attracting rural youth to already overcrowded cities and compounds the

problems of urban unemployment and other urban problems. Although these problems are currently less serious than in West African cities, such as Lagos, they cannot be wisely ignored.

Another major defect of East African manufacturing industries is that, except for cotton textiles and some food and food products, they are not based on domestic resources. Although domestic resource based industries account for at least a third of total manufacturing output, their contribution to the gross domestic product, in terms of value added, is proportionately lower. As long as they produce mainly for the domestic market, they are seldom growth industries, constrained as they are by the small size of the domestic market and by the operation of Engel's law.

In many manufacturing industries it is not uncommon for 60 percent or more of all raw materials to be imported. Growth of manufacturing activities therefore has little impact on demand for domestic agricultural produce. In some cases, such as sugar in Ethiopia and Uganda, a factory based on domestic resources may choose to grow its own raw materials. Expansion of manufacturing in such cases does not have appreciable spill over effects on the majority of farmers. It is hardly surprising that African farmers are mostly people without skills for other occupations and that those of their children who have some education flock to the cities where, in spite of the odds against them, there is at least some chance of achieving more than is possible on the African farm today.

The high import requirements of manufactures often mean that East African manufacturing industries earn little or no net foreign exchange. Moreover, high protective tariff walls are liable to breed industries that remain perpetual infants. To the extent that the resource misallocation entailed in these industries waste the nation's economic resources, they leave

fewer recourses available for developing other sectors, including agriculture.

What Can Be Done?

It appears that little can be done on the side of agriculture to improve interrelationships between agriculture and manufacturing because of inadequate demand and poor infrastructure and other distribution facilities. On the side of manufacturing, however, much could be done to increase demand for agricultural products and generally strengthen linkages between agriculture and manufacturing.

The contribution of manufacturing to the GDP could be increased enormously if emphasis were shifted toward manufacturing for export and goods for which there is potential rural demand. Manufacturing industries in East Africa and the rest of Africa need to be more outward looking than they have been to date. Agricultural exports are still mostly raw and unprocessed when they leave the country of origin.

To transform potential rural demand into effective demand, emphasis needs to be shifted to manufacturing subsectors based on domestic resource availabilities, subsectors in which the country has comparative advantage. Expansion of such industries would generate higher incomes for domestic agricultural producers. The higher incomes would not only increase widespread rural demand for manufactures but also diminish the pressure to migrate to cities. More employment would also be generated directly in rural areas and indirectly through the secondary effects of dynamic interaction between agriculture and manufacturing. Increased demand for domestic agricultural produce for domestic manufacturing would set up pressures to increase total agricultural output and stimulate demand for industries producing intermediate goods for the agricultural sector.

Some industries based on domestic resources would find it more economical to locate near their supply source rather than their product market.

The result would be greater geographical dispersion of manufacturing enterprises. Thus, basing manufacturing more firmly on domestic resources would partially relieve present urban problems by slowing down the rate of rural urban migration and by distributing rural urban migrants over a wider geographical area.

Other policies would be needed to aid the geographical diversification of manufacturing. It may be necessary, for instance, to subsidize new enterprises to be located in specified areas or to reform the banking system to serve national development needs more diligently. The effectiveness of such policies, however, would be dubious unless manufacturing is based on local resource availabilities which give it a comparative advantage.

To me, agriculture and manufacturing in Africa are not competitors but potentially complementary sectors whose interdependence needs to be fostered. It will be necessary to replace the fragmented dualistic economies of Africa with fully integrated economies if the fruits of development are to reach a much larger segment of the people in terms of higher incomes and employment opportunities.

THE VALUE OF LABOR IN SMALL-FARM AGRICULTURE:
THE CASE OF AFRICAN FARMERS

by Godwin Okurume*



In most developing countries, "development programs that place the relief of poverty, the elimination of malnutrition, and the provision of employment high among their goals must give prime attention to agriculture."^{1/} For this attention to have maximum impact, it must focus on peasant smallholders who typically constitute the bulk of the poor in developing nations. Low level technology and low productivity restrict small farmers to low incomes and often inadequate marketable surplus to feed rapidly growing urban populations. Appropriate incentives would be needed to induce farmers to accept modernizing influences, but the appropriateness of given incentives could hardly be determined without adequate knowledge of the conditions of peasant small farm production and of the economic cost of proposed changes.

Little factual information is available on peasant small farm agriculture to serve as a basis for such an evaluation. Most of the detailed knowledge appears to be limited, in the case of individual experts, to particular geographical areas and the temptation is great for each expert to generalize from the special problems of the area he knows. However, because the nature of the problem varies widely from place to place, such generalizations often provide, at best, a shaky basis for

* Economist in the Western Africa Region of the World Bank. This paper was prepared for a Purdue University Workshop on Small Farm Agriculture, November 13-15, 1972. The views expressed are personal and not necessarily shared by the World Bank. I have benefitted from comments by Marvin Miracle of the University of Wisconsin, John H. Cleave of the IBRD and Emmanuel K. Martey of the IMF on earlier drafts of the paper. None of them, however, may be held responsible for any remaining errors.

policy prescriptions. This is particularly true of policy prescriptions for African small farms since, as McLoughlin has noted, "Virtually no research has been done in the region on the problems of the very small farmer, though he is in the majority." ^{2/} A vital aspect about which too little is known at present is the economic value of labor on the small farm.

The objective of the paper is to provide a framework for estimating, on the basis of usually available information, the economic value or shadow price of labor in African peasant agriculture. The term peasant agriculture in this paper is used interchangeably with small farm agriculture to mean the system of farming practiced by the majority of traditional farmers, who are self-employed and, though selling varying proportions of their output for cash, are generally self-sufficient and derive their livelihood from agriculture and livestock raising. ^{3/} Africa, in the context of this paper, is to mean tropical Africa. To pursue this objective, the paper first attempts to put the African small farm in proper perspective by discussing various types of small farms. The latter analysis is necessary because important peculiarities of the traditional African small farm are seldom obvious to those whose field experiences are limited to Asia or Latin America.

The paper assumes that in rural Africa good agricultural land is still abundant. Accordingly, despite growing urban unemployment and continuing rural urban migration, labor is the binding constraint on agricultural production and opportunities for gainful employment in agriculture are available. ^{4/} Although rural underemployment admittedly abounds, this is generally not involuntary and is consistent with individual utility maximization in a rural economy where trading opportunities

are non-existent or extremely limited. ^{5/} A further assumption is that farmers are economically rational. This implies that, although non-economic factors are important to them, as indeed to people in all economies, these factors are not strong enough to cause perverse responses to economic incentives. Michael Todaro, who has carefully analyzed the African situation, puts it more forcefully: "Arguments about the irrationality of rural peasants ... are ... ill-conceived and culture-bound." ^{6/}

In an economy of this type the government might choose to tackle the problems of agricultural development by pursuing policies aimed at owner-operated small farms. For these policies to be effective, the results they promise must represent an improvement on what farmers are already achieving within the familiar confines of time-honored practices. Without a fair knowledge of the latter, it is impossible to tell whether or not a particular package represents an improvement.

The government, however, may decide to go into direct production by setting up agricultural projects that would provide superior employment opportunities for small farmers. In this case, the government must face the task of determining which projects are economically justifiable, in terms of their net contribution to the economy. Moreover, it must determine how much to pay project workers in order to induce farmers to accept the new job opportunities in preference to peasant or subsistence production activities. The government could, of course, adopt any combination of both approaches. The need to know the opportunity cost to farmers of adopting proposed policies would remain unchanged.

Types of Small Farms

Small farms are not homogeneous entities. Their small size, their low incomes, and their slowness to adopt known technology are often due to different reasons. These differences in the underlying conditions of small farm production often explain differences in the severity of rural poverty and suggest why strategies that are appropriate in one area may be totally irrelevant in another area.

On the basis of land availability and the structure of land ownership, three broad types of small farm economies can be distinguished: the "Asian type," the "Latin American type," and the "African type." The Asian type small farm economy prevalent in countries such as Bangladesh, India, Pakistan, and Taiwan is characterized by an overall land deficit due to high population densities. The Latin American type is characterized by "large numbers of small farms and a large proportion of the land area in very large units." ^{7/} The unique feature of the African type small farm economy is the coexistence of small farms and abundant unused arable land. In other words, the Asian type small farm is a consequence of overpopulation, the Latin American type a result of a land tenure system that puts too much land in too few hands, while the African farm is small because of various reasons that effectively prevent farmers from putting more land under crops.

The limiting factor for the African type small farm may in some cases be the ability of the farmer and his immediate family. ^{8/} In the majority of cases, however, where underemployment is rampant, the most plausible explanation for small farm sizes appears to be the utility maximizing work-leisure preferences of optimizing peasant farmers. In the absence of adequate markets and marketing

facilities, a farmer may be unable to exchange the increased output resulting from additional effort and, limited to consuming the small range of crops grown on his farm, he may well become saturated and cease to derive satisfaction from consuming more and therefore decide rationally against working a "full day." ^{2/} Land use patterns that encourage the fragmentation of holdings also contribute considerably to the prevalence of small farms. Land fragmentation, however, is neither inherent in nor peculiar to African small farms.

A unique feature of the Asian type is that, even if all land were evenly distributed among farmers, farm sizes would still be small. This need not be so in the Latin American type where small farms are the direct result of land ownership structure and where unused land and land-hungry small farmers could exist side by side. This means that although land ownership may be highly concentrated in some Asian type small farm economies, land reform itself would not eliminate small farms unless total farm population is drastically reduced. In some small farm economies of the Latin American type, appropriate land reform could eliminate small farms.

The Asian type small farm is not limited to Asia, of course, since it is basically the result of a relationship between population and arable land. For example, given the level of technology, a population density that would not be of great concern in Uganda where most of the land is suitable for agriculture may impose so much pressure on land as to cause widespread famine in Mali or Somalia where only 20 percent and 13 percent respectively of the land is arable. The fact that only a small proportion of the land is cultivable is not sufficient, however, to put an economy in the Asian type category. In Somalia, for instance, only about one-eighth

of the arable land is actually cultivated. ^{10/} Similarly, the Latin American type is not limited to Latin American countries. It prevails in Ethiopia and was also characteristic of most of East and Central Africa before Independence.

In the Asian and Latin American type small farms, labor quickly becomes surplus in the Fei-Ranis sense, namely that "with land held constant, any further increases of labor render that factor redundant, as output can no longer be raised." ^{11/} This situation would prevail even if there were incentives to expand production. In practice, the available work may be shared among all family members, with each member working less than would be suggested by his work leisure preferences. Under this set-up, everybody is involuntarily underemployed and the removal of part of the farm population need not lead to a reduction in total manhours of work or in total output, even if the marginal product of labor was positive to begin with. Like the sword of Damocles, the specter of hunger (i.e. undernutrition) hangs precariously over this type of small farm economy, its severity depending on the degree of population pressure on agricultural land.

In the African type small farm economy, where underemployment is generally not involuntary, improved incentives at farmgate can cause more land to be brought under crops. Consequently, additional labor, whether in terms of number of workers or in terms of manhours, does lead to an increase in total output. Except for times of crop failure caused by periodic droughts, death from hunger is rare in these small farm types. The scourge of the African type peasant farmer is malnutrition due not only to low incomes but probably also to the small range of consumer goods to which he is limited, in the absence of adequate trading opportunities, by his production. He may also suffer from some undernutrition if he consumes

only carbohydrates and generally reaches his physical capacity before his calorie intake reaches minimum requirements. An important explanation for inadequate diets, particularly malnutrition, too often overlooked is the peasant farmer's ignorance of his nutritional requirements, even when all the appropriate foods are available. In such cases, the most effective way to induce farmers to improve their diet may be consumer education.

The preceding analysis suggests that measures to improve the lot of the small farmer should differ with the type of small farm economy, since their problems vary in kind and complexity. In the Asian type small farm economy, agricultural development often requires expensive land reclamation and yield-increasing innovations that may be too expensive for small farmers to adopt. Even when small farmers have the resources these are usually very limited and, because of typically poor credit facilities, they may be reluctant to commit their limited assets to trials of new seed varieties and new production techniques the results of which may fluctuate over unacceptably wide ranges from year to year, at least in the initial stages.

Small farms tend to remain small in the Latin American type economy because of the political difficulty of redistributing land from large landlords to smallholders. In the case of a tenancy system, there is the additional problem of security of tenure. Successful adoption of an innovation may benefit the landlord almost exclusively, depending on the sharing arrangements. Alternatively, it may encourage landlords to evict their tenants who might otherwise share some of the fruits of innovation. Accordingly, innovations tend to benefit only the large farmers, citizens or expatriates, who are already well-off.

The problem of the African type small farm is potentially much less difficult. Improved incentives effectively translated to the farm level can induce increased production, even without a change in technology since unused arable land is available and labor is underemployed. Where land fragmentation is a problem, land consolidation is politically feasible since it can benefit all participants and would entail little, if any, conflict of interests. Such consolidation can be achieved through partnerships among family members or wider-based cooperatives. Consolidation of holdings among Asian and Latin American type small farmers would be equally feasible, but this would not solve their basic problem as in the African case.

Is communal land ownership, prevalent in the African type small farm economies, likely to prevent small farmers from responding appropriately to economic incentives? Such obstacles do not appear to be inherent in communal land tenure. ^{12/} For one thing, although the land is communally owned, it is usually worked for individual profit. For another, in spite of the apparent insecurity of tenure, there are often arrangements for compensating individuals dispossessed of their land for major improvements such as buildings and perennial crops. ^{13/} More importantly, continuing rights of use are usually recognized. Thus, an agricultural census in Uganda reported in 1965/66 that "in each region over 97 per cent of the land holders claimed that they 'owned' the land which they cultivated; this may be interpreted to mean that they claimed the right to use the land indefinitely." ^{14/} Whatever institutional rigidities there are do not appear to be associated with communal land tenure and are likely to yield to a sufficiently buoyant demand for farm products. ^{15/}

Shadow Price of Labor

Despite the responsiveness of the African small farmer to economic incentives, a government or development agency may elect to engage in direct production for a number of reasons. It may be due to the difficulties and cost of reaching widely scattered peasant farmers or to a need to supplement the farmers' inadequate marketable surplus and keep down urban food prices. Where reliability of supplies is important, a factory, publicly or privately owned, may have to produce part or all of its raw materials in order to operate steadily at full capacity. Project farms may also be established for the purpose of conducting experiments which small farmers cannot undertake or in order to attract rural labor away from the subsistence or non-monetary sector into the cash economy. The reasons could be strictly ideological.

Whatever the reasons may be, it seems obvious that labor should not be given the same value in the three types of small farm economies. While there are strong pressures for Asian and Latin American type small farmers to seek opportunities outside the farm, the pressures are not so great in the African type situation. The literature and casual observation in the field suggest that most of the rural-urban migrants in Africa are young educated people who, by virtue of their education, are expected to seek non-farm careers. On Ghana, John C. Caldwell has reported: "in a 1963 survey of rural areas one of the most common responses to the query why someone had gone to the town while another had not was that the former had been to school in contrast to the latter." ^{16/}

This casts doubt on the validity of views such as: "The poor, who in Nigeria, Peru, Kenya and India alike have only their unskilled labor to offer for a living, flock wherever there is even a slight promise

of employment and income." ^{17/} For the African small farmer, the promised income must, at least over time, be substantial in real terms compared with corresponding levels of small farm incomes. To place a zero shadow price on African agricultural labor would therefore understate the economic cost of the project and inflate its attractiveness.

Average urban wage rates for unskilled labor are generally known to exceed this shadow price considerably but give little indication of an appropriate value for the shadow price. ^{18/} It is safe to assume, however, that whenever a farmer freely chooses to work on a project farm for a certain wage, he considers that he cannot increase the rate of return to his labor by shifting into peasant agriculture.

The average annual income per farmer in peasant agriculture is probably the best indicator of the rate of return to a peasant farmer. ^{19/} For countries with national accounts statistics this information is readily available or can be estimated with little difficulty. But certain adjustments may have to be made before this annual figure can be compared meaningfully with wage rates on projects.

First, it is necessary to establish whether the estimated income of the farmer relates only to income from farming or to his total income, some of which is derived in cash and in kind from non-farm sources. It is now well-established that peasant farmers devote a considerable proportion of their working time to productive activities outside agriculture. ^{20/} (It was always common knowledge in African villages)! In the remote villages, this non-agricultural gainful employment consists primarily of traditional activities - building construction and repairs, manufacture of household utensils and simple agricultural implements, etc. - the products of which rarely find their way into the cash economy. It makes a

great deal of difference whether the estimated income of farmers includes imputed values for these non-marketed goods. Housing, for example, makes little claim on the cash incomes of farmers. It would be important to potential project employees whether they can continue to produce such goods and services for themselves at little or no cost or have to pay for them from their wages.

Second, is the work year for the farmer equivalent to the work year for the project employee? Since these may vary in length and employees are likely to be paid only for days worked, it may be more appropriate to compare daily wage rates. The daily wage rate in peasant agriculture appropriate for comparison would be that which relates the estimated annual income to the number of days a year a typical farmer works, and not to the 365 days in the year.

For instance, in a survey of Northern Nigeria, David Norman found that farmers worked about 139 days a year (about 38 percent of the available days) on their farms. When days devoted to non-farm work are included, the total number of days a year a farmer works rises to 226 or 62 percent of the available days.^{21/} Evidently, if the project employee has to put in more days a year than he worked as a farmer, he may have to curtail not only his leisure but also his production of non-agricultural subsistence goods and rely on the market for their supply. The implicit reduction in real income would be reflected in the farmer's transfer cost.

Workers, whether in a General Motors plant in Michigan or a tobacco farm in Malawi, are ultimately concerned about the remuneration they receive for each unit of time they work. When labor unions negotiate for higher wages, the length of the work week is usually fixed and known, and management is not normally free to lengthen it or curtail annual leave entitlements when the weekly wage rate rises.

These remarks suggest that even daily wage rates are comparable only if the length of the work day is the same in both peasant and project farms. The length of the work day in peasant agriculture is liable to vary with the time of year and from farmer to farmer. ^{22/} In the Northern Nigerian survey mentioned earlier, it was found that farmers, on the average, spent 4.5 hours a day on farm work, exclusive of travel time to and from the farm. Clearly, an economically rational farmer would demand a higher daily wage for an eight-hour day - the standard work day for hired labor is rarely shorter than this - than for a four or five hour day.

To illustrate, consider a small farm economy where the typical farmer's net income is \$80 a year. If this income is from farm work alone (Case I), the implicit wage rate (based on 139 days) is 58 cents a day. If it includes income from non-farm work (Case II), the implicit daily wage rate (based on 226 days) is 35 cents. Now suppose an employee on the project farm is to be paid 50 cents a day. If the peasant farmer's work day is equal to that of the project farm employee, it seems clearly to make sense for the farmer in Case II to choose project farm employment. It would be difficult to explain why an economically rational farmer would accept project employment in Case I, since he would be eight cents a day richer by staying in peasant agriculture. However, the project daily wage rate of 50 cents implies an hourly wage rate of 11 cents for a 4.5-hour day, 8 cents for a 6-hour day, and 6 cents for an 8-hour day. The implicit hourly wage rate for a peasant farm is 13 cents in Case I and, assuming the same average day for non-farm work, 8 cents in Case II. In Case I, it would be irrational for an employee to remain in project employment if the work day is the same length as in peasant farming. In Case II, it would make sense for him to accept or continue project employment only if the project work day does not exceed six hours.

Some General Observations

Given an eight-hour day on project farms, it makes no economic sense in Case I or Case II, other things being equal, for labor to accept or continue project employment rather than take up peasant agriculture. But often other things are not equal and some rural labor may prefer project employment in either case. Some workers may prefer the relative security of a definite wage to the uncertain outcome of self employment in agriculture, subject as it is to the vagaries of the weather. Depending on the prevailing circumstances, an hour of work on a subsistence or family farm may be more arduous than an hour on a project farm. The less productive farmers may be more easily attracted from self employment to paid employment. Finally, farmers, who are underemployed because of inadequate effective demand for their products, may accept a lower hourly wage rate in exchange for the opportunity to earn higher annual incomes. A thorough knowledge of local conditions is necessary for deciding whether actual average rate of return to labor will form an adequate decision variable, and, if not, what relative weights should be assigned to the various factors enumerated.

The preceding illustration implicitly assumes that there is a single shadow price for farm labor and that it is constant throughout the year. In practice, the opportunity cost of farm labor varies with the time of year because of the nature of farm activities. Accordingly, where a project provides full time employment for less than the whole year, only the shadow price for the appropriate time periods should be taken into account. In all cases, where a single average shadow price is to be used, it should be a weighted average, taking fully into account seasonal variations in the opportunity cost of farm labor.

Suppose, for instance, that the share of a farmer's annual income attributable to any season varies directly with the proportion of his annual manhours worked during that time period. This annual income Y may thus be represented as the summation of the periodic earnings:

$$Y = \sum a_i Y$$

where $\sum a_i = 1$, and

a_i = manhours worked in period i as a proportion
of annual manhours worked. 23/

Note that zero earnings (zero opportunity cost) are automatically assigned to periods of no work. Correspondingly high values are similarly attached to periods of peak labor demand on the peasant farm. Hence the opportunity cost to the farmer of working six months a year on the project would depend on the particular months required of him.

The data used for the above illustration are for Zaria Province of Northern Nigeria, where a short rainy season and a generally harsh arid climate impose a severe constraint on the length of the farming season. The very high temperatures also probably limit the number of hours a farmer can work effectively before he is fatigued. Where the climate is more favorable, the typical farmer may be reasonably assumed to work both more days a year and more hours a day, if justified by demand conditions. In the absence of actual data, one may hypothesize that number of days worked is proportional to the length of the rainy season while the length of the work day may be related not only to some measure of humidity and temperature but also to the importance of timing to some farming operations.

If the project in question is large enough for its implementation to cause a substantial reduction in the peasant farming population, food prices may rise. Farmers who were underemployed because of demand deficiency

would take advantage of the situation by increasing production. One effect of the project would be to improve the welfare of those left in the small farm sector and make further emigration less attractive. Besides, the opportunity cost of the project will fall short of the sum of the marginal products of emigrants by the amount of the increase in production by those who remain in peasant agriculture. If the project increases total output by more than the total reduction in small farm production directly due to emigrants, agricultural prices may fall and the opportunity cost of the project increase by the fall in production by those who remain in peasant agriculture. This opportunity cost would increase even further if the job opportunities created by the project were to cause more people to abandon peasant agriculture than can be absorbed by the project. ^{24/} In most practical cases, however, the project is likely to be too small to have these price effects.

Conclusion

To recognize a land surplus situation, which at present distinguishes the African small farm economy from the Asian and Latin American types, is not to justify ignoring long-term policies such as population control. If recent population growth trends in Africa continue unabated, it will be only a matter of time - perhaps not very long in some cases - before African small farms take on Asian characteristics. Thus African countries would have to wrestle with the problems not only of excessive population growth rates but of over-population as well. Admittedly, population policies take 15 to 20 years to affect the labor force and this gestation period should influence the degree of urgency to be given to family planning. However, the long-term need for family planning is hardly a valid

excuse for ignoring other essential policies or for failing to plan effectively in the short and medium run with the resources currently in hand.

The problems and potential of a small farm economy depend on how the farms became small in the first instance. Under present circumstances, which are likely to continue for some years, underemployment generally prevails in small farm economies but it is involuntary in some and a result of utility maximizing preference in others. While the shadow price of labor may be closer to zero than to the labor market price in Asian and Latin American type small farms, it may be quite close to the going labor market price in rural Africa. Consequently, assumptions that are reasonably valid for Asia or Latin America may, when applied to Africa, lead to wrong policies and unexpected results.

This is not to say that African small farms are homogeneous. Examples of Latin American type small farms in Africa were cited earlier in this paper. It is also clear that small farms in Burundi and Rwanda, where population densities are very high by African standards, are closer to the Asian type in their characteristics than small farms in Nigeria, Uganda and Zambia. 25/

Development programs aimed at benefitting the small farmer must, accordingly, first recognize the heterogeneous nature of small farms and determine the particular small farm type in question. Then on the basis of local knowledge, appropriate weights can be assigned to the various factors likely to influence the decisions of rural labor. If research is to have desirable operational impact, it must provide these bricks and mortar for effective rural development planning.

FOOTNOTES

- 1/ Robert S. McNamara, "Address to the (IBRD) Board of Governors." (Washington, D.C., September 27, 1971).
- 2/ Peter F. M. McLoughlin, Agriculture in East and Central Africa (Nairobi: Longman Group, 1970), p. 19.
- 3/ Thus a pure subsistence farmer is only the special case of a peasant farmer who does not sell any of his output.
- 4/ John H. Cleave, "Labour in the Development of African Agriculture." (Unpublished Ph.D. dissertation, Stanford University Food Research Institute, 1970); Michael P. Todaro, "Income Expectations, Rural-Urban Migration and Employment in Africa," International Labor Review, 104 (November 1971), 387-413; McLoughlin, op.cit., p. 16.
- 5/ Gerald K. Helleiner, Peasant Agriculture, Government, and Economic Growth in Nigeria (Homewood, Illinois: Richard D. Irwin, 1966). McLoughlin similarly notes, "The typical African farmer certainly tends to get the most from his resources and situation." (op.cit., p. 16). See also Godwin E. Okurume, Foreign Trade and the Subsistence Sector in Nigeria (Praeger Publishers, forthcoming) for a theoretical analysis of such a situation. It should be noted that "underemployment" is a meaningful term only in the context of an externally defined work week or work year. The existence of underemployment in this sense is consistent with any value of the marginal product of labor.
- 6/ op. cit., p. 393.
- 7/ Kenneth L. Bachman and Raymond P. Christensen, "The Economics of Farm Size" in Agricultural Development and Economic Growth (Ithaca, New York: Cornell University Press, 1967), Herman M. Southworth and Bruce F. Johnston (eds.), 234-57.
- 8/ Bachman and Christensen, op. cit., p. 243.
- 9/ Okurume, op. cit., chap. 2. Evidence of the coexistence of unutilized land and underutilized labor is also documented by Helleiner and McLoughlin.
- 10/ Somali Republic Planning Commission, Short Term Development Plan: 1968-1970 (Mogadiscio, 1968), p. 57.
- 11/ John C. H. Fei and Gustav Ranis, Development of the Labor Surplus Economy (Homewood, Illinois: Richard D. Irwin, 1964), p. 11.

- 12/ Gerard Clauson, Communal Land Tenure (Rome: Food Agriculture Organization, 1953), gives a detailed analysis of various types of land tenure. See also Okurume, op. cit., for a more recent analysis of the Nigerian situation.
- 13/ Okurume, op. cit., chap. 3.
- 14/ A. R. Dunbar and D. Stephens, "Social Background," chap. 8 in Agriculture in Uganda (London: Oxford University Press, 1970), J. D. Jameson (ed.), p. 104.
- 15/ Glenn L. Johnson et al., Strategies and Recommendations for Nigerian Rural Development, 1969/1985 (USAID/Consortium for the Study of Nigerian Rural Development, 1969), p. 28.
- 16/ John C. Caldwell, "The Demographic Implications of the Extension of Education in a Developing Country: Ghana." (unpublished paper).
- 17/ Uma J. Lele and John W. Mellor, "Jobs, Poverty and the 'Green Revolution'," International Affairs, 48 (January 1972), 20-32. Emphasis mine.
- 18/ For example, see Todaro's article cited above.
- 19/ Since both factors of production, land and labor, can be increased in equal proportions, the marginal productivity of labor is unlikely to deviate appreciably from the average productivity, assuming constant returns to scale.
- 20/ David W. Norman, "Labour Inputs of Farmers," Nigerian Journal of Economics and Social Studies, 11 (March 1969), 3-14; Edwin Dean, The Supply Responses of African Farmers (Amsterdam: North Holland Publishing Co., 1966), p. 23; Cleave, op. cit., and Okurume, op. cit., chap. 4.
- 21/ op. cit.
- 22/ A. K. Sen, "Peasants and Dualism With or Without Surplus Labor," Journal of Political Economy, 74 (October 1966), p. 432.
- 23/ Weights based on mandays rather than manhours may be equally satisfactory. It is likely that hours worked per day and days worked per period are positively correlated. Presumably the longer work week on a family farm is in response to higher expected earnings in that period.
- 24/ Todaro, op. cit., p. 395.
- 25/ For example, see McLoughlin, op. cit., p. 19.

ACHIEVING RURAL DEVELOPMENT

by Godwin Okurume*



If rural development programs fail to make their maximum impact in our time, it will probably be due primarily to serious divergencies between planners' goals and specific rural needs. Rural development policies are generally formulated by officials in government departments of foreign aid foundations and agencies whose interests lie largely outside the rural sector. These policy-makers often determine their goals and strategies for rural development without adequately involving rural dwellers, since many believe that the latter are either ignorant of their problems and aspirations or else hellbent against all change. Moreover, when a policy can trace its origins to a respectable source, few ask whether the elegant mathematical model bears enough correspondence to the real world to light the path of operational people. Frequently, therefore, any correspondence between planners' goals and rural needs is determined by chance.

There is little reason to suppose that such divergencies are a result of indifference or technical incompetence in program offices. A more plausible suspect is, among others, the inadequacy of relevant operational experience of village life on the part of program developers.

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A farmer from Iowa or Australia observing a peasant farmer or other villagers at work in East or West Africa would in many respects be as much confounded by the differences as would a visitor who had spent all his life in London or New York City. Rural production activities, particularly agriculture, are subject to a variety of strong constraints many of which are peculiar to specific areas and quite irrelevant in others, especially in developed countries. Yet, as Peter McLoughlin has pointed out, little relevant research has been done to identify rural needs and provide an effective basis for transforming poor rural economies^{1/}.

Frequent and extended visits by such outsiders undoubtedly increase their understanding of the situation but rarely do they lead to a full comprehension of the multifarious interests which the rural dweller must take into account in making decisions in an environment where income levels are abysmally low and stagnant, where opportunities for self-advancement are scarce and the means of seizing such opportunities all too often completely absent, and where individuals and their families alone must provide for their welfare in old age or bad health and fully shoulder the consequences of whatever errors of judgment they make. It is an environment fraught with risks and uncertainties, which most rural people must avoid at great cost because the characteristic poor capital markets make risk-taking very dangerous and sometimes fatal. The situation baffles even local policy-makers, who, largely alienated from rural life, tend to view rural problems and interests through the distorting spectacles of the urban and industrial establishment. Similar observations in East and Central Africa have prompted the following remark

from McLoughlin: "It is truly remarkable how differently a farmer or herder, on the one hand, and an agricultural or livestock officer on the other, can view the same situation."^{2/}

Whatever the causes may be for the frequent errors in the diagnosis of the rural development problem, it is obvious that one of the most important tasks of rural development programming should be a clear specification of the goals sought. Section I of this paper deals with this subject. Section II examines alternative strategies that might be employed in pursuit of rural development. A third section is concerned with the selection of projects to be implemented. Finally, the paper discusses the outlook for rural development in subsaharan Africa, the region with which the paper is primarily concerned.

I. Goals

There can be little disagreement about the ultimate objective of rural development, namely, to make the countryside a better place for its inhabitants. Defined in such broad terms, rural development differs from overall national development only in scope. The scope of rural development could be justified on humanitarian grounds, since 80 percent of the people in the developing world, among them the poorest, live in the countryside. However, there are even more compelling political and economic reasons for the urgency of rural development. At a time when growing urban unemployment seriously threatens the political stability of many countries, rural development, to the extent that it may make rural life more attractive, holds out some hope for slowing down the rural-urban exodus and possibly terminating it and attracting some of the urban unemployed back to the land.^{3/}

What developments would be considered as elements in the improvement in rural life? Clearly, an increase in the per capita real income of the rural population would be one. Such an increase would in the long run have to be self-sustaining and not require permanent support from the government or other external sources. For if it were simply a matter of putting the poor on welfare, it could probably be done more easily and more cheaply for the urban poor. Few would regard such a goal as desirable, even if it were feasible. Moreover, the increase in rural real incomes should affect directly a large proportion of the rural population rather than be restricted to a small segment.

This implies an increase in opportunities for gainful employment. As is now widely recognized, redistribution of a given aggregate income is virtually impossible and consequently an increase in income for one segment of the rural population does not necessarily lead to an improvement in rural social welfare. A rural development program must therefore recognize employment generation explicitly as a target rather than merely recognize it in a footnote.^{4/}

The objectives specified above may well be criticized as too restrictive, too limited in scope. As E. K. Fisk put it recently, "the aims of rural development are not solely, nor even primarily, economic."^{5/} Rural people, like people everywhere, need good housing, clean water and adequate health facilities, not to mention schools and recreation facilities. Surely no one can dispute the need to improve the total rural environment. The question is, how is this to be realized?

One possibility is to provide these things as a public service. A major weakness of this approach is that, owing to budget considerations,

such facilities could not be provided on a wide scale and the government's efforts would have little impact on the rural environment, even in the long run. Besides, if rural educational facilities, for instance, are not matched by adequate opportunities for employment and self-improvement, the youth would still abandon their rural homes upon graduation.

An alternative approach is first to increase the purchasing power of rural people and then to provide other goods and services as warranted by their rising incomes. This is not to say that the various facilities should never be provided gratis or at subsidized rates. In some cases, the availability of these facilities, such as safe and plentiful water, may be a necessary condition for increasing productivity and income levels. The government may with good reason absorb the costs of such facilities, at least in the initial stages. In other cases, the government may initially have to provide some facilities in a similar manner in order to persuade rural dwellers that they can, in fact, realize these goods and services without having to go to the city. These departures from the general approach, however, are clearly short run measures and impose no permanent burden on the government budget. Accordingly, projects requiring them can be replicated easily and could lead to a transformation of the rural environment over time.

It is for this reason that the objectives of rural development must be stated in terms of concrete policy targets at which programs can aim. These targets, being measurable, provide a yardstick for assessing the effectiveness of particular programs. They are consistent with the ultimate objective of rural development and, far from being narrowly

economic, constitute the fountainhead from which the other elements of an improved rural society could flow.

Who are the rural people, the intended direct beneficiaries of rural development programs? They are generally self-sufficient and self-employed and derive their livelihood from primary activities, especially agriculture and livestock raising. Although these characteristics would apply to many traditional towns, such as in the Western State of Nigeria, the rural sector, functionally defined, should exclude these large communities. In Nigeria, one might include only communities with less than 5,000 persons each. A different line of demarcation may be more appropriate for some other place, but it would probably include in the rural sector at least 50 percent of the total population of the country in question.

More importantly, it should be noted that determining the population size that excludes a community from the rural sector is irrelevant for operational purposes. In most countries, communities that would unanimously be considered rural are many enough to absorb all the energies likely to be forthcoming from rural developers. Without defining the rural sector precisely, many would, in fact, be satisfied to see emphasis in development effort shifting away from the major urban centers such as Dar es Salaam, Jinja, Lagos and Nairobi. The real question therefore is, what can be done to achieve the rural development targets specified above?

II. Strategy

Although agricultural development does not necessarily lead to rural development as defined above, rural development at least in the

African context, is basically agricultural development. Most rural people throughout Africa are engaged in agriculture. To have widespread impact, therefore, most rural development programs would be dominated by the agricultural component. Allowance should, of course, be made in such programs for non-agricultural components, such as public services and other activities serving the rural population. These components, however, should by and large be tailor-made to serve the needs of increasing per capita agricultural output and employment in the long run. The requirements for successful rural development would thus be closely allied with the requirements for agricultural development.^{6/}

A major requirement at the project level is the availability of all essential agricultural inputs. This means not just one or two inputs but the set of all inputs called for by a given situation. Elements of the set may vary from place to place. Inadequate water supply, for instance, constrains agricultural development far more seriously in Somalia and Upper Volta than in Ghana or Uganda. In another place the missing link may be fertilizer and credit and in a third both inputs and more. It should be noted that when complementary inputs are required, providing only some of the inputs in the set may result in little improvement in performance. Failure to appreciate this fundamental point may have led colonial experts too often to recommend that in Africa agricultural innovations be introduced piecemeal, presumably because farmers would be unable to understand and adopt several changes simultaneously.

In recent years, the need for an integrated approach to rural development has gained recognition. In practice, the approach appears

to have emphasized the sufficiency of the set of inputs, but whether each element of the set was necessary for the job in hand appears to have received little thought. Accordingly, some rural development projects, particularly those financed from external sources, have been characterized by high capital intensity, high expatriate input and, consequently, high cost per farmer involved. Such expensive programs cannot be provided on a wide scale and are doomed to have little impact on rural society.

A more careful approach would focus on the set of all and only the necessary inputs which together would just be sufficient to produce the desired results. This approach should lead to projects with relatively low cost per farmer and satisfactory cost-benefit ratios. One of the main tasks of rural developers should be the determination of the optimal or efficient package for each rural development project area.^{7/} In most places adequate marketing arrangements for inputs as well as output would be an essential component.

Although the discussion so far has been in terms of direct inputs, many input packages would not be optimal and hence not effective unless they included a number of inputs that are not normally associated with agricultural production. Such indirect inputs may include the provision of non-agricultural incentive consumer goods and services. This may require the development of regional centers or small towns, if this is necessary for producing the incentive goods where they can be delivered to rural consumers at minimum cost. Another indirect input may be education. Agricultural education, for example, may facilitate the adoption of new agricultural techniques and technical education may

ensure that tractors stay in use rather than stand idle because of minor technical problems. Similarly, an essential health program may increase productivity per man-hour as well as the number of working days per worker.

Often technical assistance would be required to teach farmers the practical application of a new system on their own farms and to give encouragement to vacillating farmers during the early stages of an innovation. For understandable reasons, rural people, who have little to fall back on in times of crop failure and are not in the habit of experimentation, are hesitant to take on new techniques until they have been proved successful beyond reasonable doubt. This problem of farmers' attitudes quickly disappears, however, once the economic superiority of a new technique has been established.

III. Project Selection

Sometimes the implementation of rural development projects runs into difficulties not because of inappropriate strategies but because of the choice of projects to be implemented. As a first approximation, it may be assumed that a project or innovation will be accepted by farmers only if it results in a net increase in crop yields per acre or productivity per man-hour. In other words, for the purpose of this analysis, those cases will be ignored where an innovation may be adopted because it makes each man-hour of work less arduous even though it does not increase yields or labor productivity.

The positive impact on yields, however, would not prove that a project is socially desirable or guarantee a favorable response from

farmers. The project would have to be examined in terms of its effect on incomes and employment. In this connection, it is useful to distinguish between crops intended primarily for the internal market and those intended for export.

Where the internal market is small, an increase in crop production for the domestic market would, in the absence of a sufficient increase in effective demand, lead to a fall in crop prices. If the price decrease is sufficiently large, aggregate and per capita farm incomes may fall or remain unchanged. Such a project or innovation is likely to be rejected outright or after a short trial period. An alternative outcome is the adoption of the technique by a few farmers but at the cost of driving the less efficient farmers back into subsistence production. As Lester Brown has rightly pointed out regarding the green revolution in Asia, "... for those farmers who do not have access to the new technologies, declining grain prices may mean a worse income and consumption position."^{8/} The latter outcome, however, may push more people from the countryside and exacerbate the urban unemployment problem as well as make income distribution more uneven. From a macro-economic point of view, it would be desirable to have only projects that would generate gainful employment opportunities on a large scale. For such projects to have any appeal to the individual farmer, they must promise higher incomes for all participating farmers.

With export crops, most countries, being too small individually to affect world prices by their own actions, would normally increase total and per capita rural incomes by increasing production. In each

case, of course, a country would need to ensure that the relevant world prices are not likely to fall to unacceptably low levels due to external forces. Here, even when the income effects are satisfactory, the employment effects may be negative and encourage rural-urban migration. Export potential for many crops, however, is drastically limited by the growth of external demand and the high tariff walls and other devices protecting agricultural production in developed countries. It would thus be reasonable for a developing country to be wary about engaging in agricultural projects that are unlikely to create additional jobs for rural people, although in specific cases the increase in income or foreign exchange earnings may be high enough to justify a project.

Briefly, projects selected for implementation stand a far better chance of success if they are economically viable. In this regard, consideration should be given not only to total benefits but also to the distribution of these benefits as reflected in the employment effects of the project.

IV. Outlook

Throughout subsaharan Africa land and labor are either in surplus supply or underemployed, owing primarily to product market constraints. Supply responses are therefore potentially very elastic. But the provision of adequate markets and marketing facilities alone may not solve the production problem satisfactorily, except perhaps in the short run. Agriculture in this region is characterized by the predominance of peasant smallholders. These usually lack the knowledge required for experimentation as well as the resources with which to

implement available new technology. The latter situation is particularly likely when use of the new technology requires substantial investments such as for water control and drainage in dwarf rice cultivation in Japan and Taiwan. Accordingly, the need often arises for peasant and other small farmers to pool their resources in order to be able to take advantage of new opportunities.

Is this group action approach feasible in Africa? There seems no reason for pessimism since cooperation on an ad hoc basis has long been an African tradition. There have also been experiments based on the group approach to rural development, which suggest that the outlook may be bright. However, these experiments are still in their early stages and it is perhaps too soon to evaluate their effectiveness fully.^{2/}

The first case is the ujamaa village program in Tanzania, the country that appears more committed to rural development than any other in Africa. The program aims at developing self-reliant villages or rural communities where people will live and work together more or less along the lines of the extended family system. Cooperation, which is intended to be voluntary, entails the pooling of resources for the performance of individual tasks or groups of related tasks in the production process or for the development of common social services for the good of all members of the community. The degree of cooperation may therefore vary among ujamaa villages according to the needs of each community. In order to foster more of these communities, the government gives priority to ujamaa villages in the allocation of development resources.

A most promising feature of the ujamaa village program is that it builds on a firm foundation of communal rural life. The scope of the program transcends the field of economics; but the socio-political objectives need not be at variance with its economic objectives. More serious problems are likely to arise from administrative bottlenecks. There is also the ever-present danger that government preference for ujamaa villages may divert resources from other activities that should have a prior claim on resources.

Somalia started a similar experiment in rural development in 1970. Its so-called agricultural crash program aims at increasing food production and farm incomes and at creating jobs in agriculture for young people. In a country where food imports account for about 25 percent of the annual import bill and where the urban unemployment rate is about 50 percent, these objectives reflect the real needs of the economy. The participants in the agricultural crash program, or pioneers as they are called, are chosen from groups of volunteers, mostly from the urban unemployed. With token cash payments and plenty of material support, the government ensures that the pioneers in each project work together as a group. The ultimate goal is to convert the pioneers in each program project into an agricultural cooperative, independent, self-reliant, and operating its farm or farms for its own profit.

The agricultural crash program is at present heavily subsidized by the government and it is not clear how soon it will become self-financing and cease to be a drain on the government's modest budget. It may also encounter an administrative bottleneck. These problems may

be complicated further by a more basic problem common to experiments of this sort, namely, a failure to provide for an adequate review mechanism to enable an objective evaluation to be made of the effectiveness of past program policies.

If these well-intended experiments fail, it would be difficult to blame the failure on rural people. Careful studies carried out in Ghana, Malawi, Nigeria, Uganda and other parts of the developing world have established beyond doubt that peasant farmers and other villagers respond normally to economic incentives. The effectiveness of rural development programs may depend heavily on the willingness of government to alter the rural-urban structure of incentives.

Government officials, alienated as they often are from rural people, may honestly misunderstand the real needs of rural people. Many rural development programs may therefore encounter initial difficulties, despite the dedication of officials. Such programs may need sympathetic external support during the transitional period. There is hope in the fact that dedicated officials do learn in time. However, this hope can hardly be realized unless officials with this direct experience are given increasing opportunity to influence rural development policy. Finally, it should be noted that if local expertise in rural development is to be fostered, if the gap between rural needs and the goals of rural planners is to be closed, many governments will have to reorganize their incentive systems so that officials seeking a career in rural development would not be required to make unusually great sacrifices vis-a-vis their colleagues serving the interests of the industrial and urban minority.

FOOTNOTES

1/ Peter F. M. McLoughlin, Agriculture in East and Central Africa: An Overview (Nairobi: Longman, 1970), p. 16

2/ _____, op.cit., p. 46.

McLoughlin goes on to confirm that few researchers have focused on the farmer's point of view and the results of these few attempts have seldom become readily available to policy-makers and planners.

3/ The author learned recently from farmers in parts of Mali's Haute Vallée du Niger that the relatively successful introduction of tobacco to their area has already begun to bring about this reverse migration among their youth.

4/ Mahbub ul Haq, "Employment in the 1970's: A New Perspective," International Development Review (Dec. 1971), 9-13.

5/ E. K. Fisk, "Development Goals in Rural Melanesia." Paper prepared for the Fifth Highway Waigani Seminar on "Change and Development in Rural Melanesia." (Agricultural Development Council reprint, Feb. 1972).

6/ This judgment is, of course, colored by the author's concern with and experience in Subsaharan Africa where, for the most part, the immediate growth potential of agriculture is far superior to that of any other sector. In areas where agricultural growth potential is low or requires considerable waiting time before it can be realized, or where the rural non-agricultural population is sizeable, greater weight would have to be given to non-agricultural rural projects. On this point see A. T. Mosher, "Projects of Integrated Rural Development." (Agricultural Development Council Paper, Dec. 1972).

- 7/ Mosher op. cit. also makes a similar point quite strongly.
- 8/ Lester R. Brown, The Social Impact of the Green Revolution
(New York: Carnegie Endowment for International Peace, 1971).
- 9/ The remarks on Tanzania and Somalia in subsequent paragraphs
are based on discussions with various persons in both countries.