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RESERVE

A MODEL OF LABOUR ALLOCATION DECISION-MAKING
IN PEASANT-TYPE HOUSEHOLDS

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A B S T R A C T

The extent of the food crisis in Sub-Saharan Africa is generating a renewed interest in the role of peasants in addressing the food problem. This paper is premised on the view that policy action with respect to agricultural development in Africa requires a realistic model of how rural peasants make decisions. In the first part of the paper we construct a model of such decision-making. The model focuses on peasant-type households as described and analysed by Chayanov. A central characteristic of such households is their attempt to seek a total of satisfactions, as producing and consuming units, rather than the pursuit of profit maximisation inherent in many micro-economic models of rural households. In the attempt to achieve its objectives, the household must make decisions concerning the allocation of its principal productive resource, labour. The model outlines the manner in which labour allocation decisions are made, subject to plausible constraints operating on rural households in Africa. The second part of the paper examines some of the implications of this model for various rural development policies.

1. INTRODUCTION

The countries of Sub-Saharan Africa face a growing food crisis. World Bank staff have documented a growing dependence on imported cereal grains, from 7.7 kgs. per capita in 1961-63 to 32.7 kgs per capita in 1980-82 (Cleaver, 1984: Table 9). The United States' Department of Agriculture estimates Africa's food imports will need to increase by a multiple of two or three times during the 1980's merely to close the gap between food productivity and population size (North-South Institute, 1983: p. 2).

As part of the current food crisis there seems to be ~~emerging~~ a growing recognition that Africa's hope for the future rests on its many rural peasants. Where large state and private farms can take some credit for successes in the area of export crops, they cannot hope to produce the food needed. That task will need to fall largely on small-holder agriculture.

This belated acceptance of the African peasants is a product of necessity, but it reflects also a recent recognition that peasants are not as fatalistic, irrational and backward as once believed**. Past attempts to impose development from above were premised on the view that peasants were a problem that had to be overcome. A good example, within the liberal, capitalist tradition, is the Swynnerton plan (Swynnerton, 1954), in Kenya in the mid-1950's, which attempted to transform peasants into yeoman, capitalist farmers. An alternative example, drawing on the conclusions of Marx and Lenin, argues African peasants are a product of colonialism, and they have to be "captured", if development is to succeed (Hyden, 1980).

In contrast, some contemporary literature is beginning to present a more positive view of peasants. They are not seen to be rational in the narrow economic sense of T.W. Schultz's Transforming Traditional Agriculture, nor is the Western view of man seen to be applicable. Rather, within the social and economic environment in which they live, they are seen to be making rational responses

** For a critical summary of the earlier views on peasants see Douglass (1970).

(e.g., Lipton, 1968; Meillassoux, 1972; Shanin, 1973; Deere and de Janvry, 1979; Lehmann, 1982). Their technology is simple, by Western standards, but is seen as ingenious within its environment (Nash, 1967: 4). Given the cyclical pattern of rainfall that dominates their lives, they tend to have a circular rather than a linear view of time (Shanin, 1971: 247). They are now recognised to have complex farming systems (Heyer, 1971: 55; Hunt, 1978: 64; Gerrard, 1983: 28). The success of agricultural projects is seen to depend on the willingness of planners and extension workers to understand the objectives and constraints under which peasant farmers operate (Hunt, 1979: 278).

The purpose of this paper is to build on this contemporary literature and to formulate a model of household decision-making with reference to the allocation of labour within a peasant-type household. Where the primary focus will be on social relations internal to the household, the social relations external to the household, reflecting the setting within which peasants must operate, will be discussed as well. The intent is to construct a model which is historically specific to contemporary Africa. We conclude with a discussion of the implications of this model for various rural development policies.

The model has its roots in the peasant-type rural households described and analysed by Chayanov (1966).^{*} This peasant-type decision-making unit has several unique features. First, it is a household economy, in contrast to an individual-based economy or some larger collective such as a village or extended group of households. This is not to say that individual household members do not strongly influence the decision-making process, or that outside forces are unimportant in the decisions taken. Rather, the model views decisions as being taken within the household in light of its collective needs, subject to a more or less pervasive social environment.

Second, the model is premised on the rural household serving as a unit of production while seeking to sustain itself as a consuming unit; it is both a unit of reproduction and a unit of

* For extensions and critiques of this model see: Shanin (1973); Harrison (1977); Deere and de Janvry (1979); Hunt (1979); Lehmann (1982); and Brignol and Crispi (1982).

production. According to Nash, in peasant societies"..... there are no durable social units based solely on production activities." (Nash, 1966: 23). Such a household unit has an objective function somewhat more complex than merely seeking to maximise profits. Since the vast majority of rural households in Africa appear to be more akin to 'peasants' than to 'commercial entrepreneurs', the model is appropriate for designing and evaluating rural development strategies.

Third, again following Chayanov, the model maintains that family labour "employed" by the household cannot be evaluated in economic terms. Rather, it is measured in terms of labour effort (self-exploitation) of the household members. In the present paper, it is assumed that non-family labour is not employed, in a conventional sense, by the household. Where such employment does occur, "..... it must be so clothed in ceremonial and ritual that selling labour power does not appear either to the buyer or the seller as a naked economic transaction." (Nash, 1966: 24). One implication of this view towards labour is that other inputs, such as capital and land, are valued by the peasant-type household at prices very different than would be the case for a typical profit-maximising enterprise*

Finally, the use of peasant-type household as the decision-making unit avoids having to distinguish between those who produce for a market and those who produce for their own immediate consumption. This is helpful because it is not generally the case that the disposition of output will, per se, influence the process by which decisions are taken.

II THE MODEL

For the purposes of the model, the definition of household is similar to Shanin's definition of family (Shanin, 1971: 242 - 243). It is a "production team" with a "hard core" which consists of a "married couple or polygamous group and their offspring." On the consumption side, it is defined by "the people who eat from the same pot." One's position within the household determines

* This point, for land in a peasant farm economy, is made by Chayanov as quoted in Wolf (1966: 15).

duties, functions and rights. All members have consumption rights which correspond "to the peasant customary understanding of property rights. Even though land, cattle and equipment may be formally defined as belonging to a man who heads a household, in actual fact he acts rather as a holder and manager of the common family property with the right to sell or give it away heavily restricted..."

(Shanin, 1973: 68). Given the priority of assuring subsistence, a hierarchical structure has evolved which serves to control the means of household reproduction: women, the food supply needed between harvests, and seeds (Meillassoux, 1972: 93). The household, as a basic unit in peasant society, defines "the pattern of peasants' everyday actions, interrelationships and values."

(Shanin, 1971: 243).

Such households are faced with a set of fundamental decisions, some of which affect immediately the household's economic welfare. Among these are decisions concerning the household's perception of acceptable living standards, the preferred allocation of productive resources and the division of income between consumption and saving. Other decisions hold implications for the long-term economic welfare of the household and include such matters as the level and composition of investment in physical and human capital, the adoption and adaptation of new production techniques, the assimilation of new consumption patterns and the desired size of the household itself.

Although useful as a heuristic device, the distinction between short-term and long-term decisions is not absolute. For example, the short-term decision with respect to saving clearly affects the household welfare in the long-term. Similarly, the long-term decisions are taken under short-term conditions and therefore must be expected to have an impact on household welfare in both the short-term and the long-term. Unless noted otherwise, the current model is concerned with household decision-making in the short-term.

It is true that households also make decisions concerning matters less obviously economic in nature. Among these are the degree to which the household is integrated socially with the

local community, the nature of religious affiliation, political allegiance and the like. Without for a moment denying that such decisions may have important implications for the household's economic welfare, the model focuses on the manner in which economic decisions, especially the labour allocation decision, are made by peasant-type households.

Household Objectives

Household behaviour and objectives are inextricably linked to the size and demographic composition of the household. Both change over time as individuals age and as households experience births, deaths and migration. During some relatively short time period, however, the size and demographic composition of the household may be viewed as fixed. Thus, given the exact age composition of the household, the size of the household may be expressed as (A), the number of adult-equivalent members of the household.

In the short-term the household may be said to possess a complex set of tastes, aspirations and perceptions of socially acceptable behaviour which, in combination with household size, largely determine the household's objectives. Without implying any rank order of relative importance, we distinguish three broad categories of household objectives.

One set of objectives concerns the household's perception of a material standard of living below which it will feel deprived, denoted here by (C), the minimum socially acceptable level of consumption per adult-equivalent member of the household. This will certainly include adequate supplies of basic foodstuffs (Hunt, 1978: 67).^{*} It also includes adequate shelter and clothing and any services judged by the household to be essential (possible examples are education and health services). More generally, (C) is a vector of goods and services identified by the household in relationship to its peers; thus (C) will vary considerably from place to place and from time to time. Since (C) is largely socially determined, it bears a strong resemblance to David

^{*} See also, Wolf's Concept of "minimum caloric rations," Wolf (1966: 5 - 10).

Ricardo's "natural price of labour"* and John S. Mill's "scale or standard of comfort.**

Household objectives also include the maintenance of a set of social relationships. That is, the household is obliged to acquire real resources (e.g., time, goods, money) with which to service social relationships connected with reciprocal exchange, feast day celebrations and ceremonial events associated with births, marriages and deaths. The exchange may be resources, such as a gift of land provided by the chief, cattle given as bride wealth, or an exchange of labour, or in the form of material aid intended to assure a guaranteed minimal subsistence for a household in need (Dalton, 1967: 71 - 74). Wolf (1966: 5 - 10) describes this objective as the need to provide for a "ceremonial fund." It is here denoted by (R), the minimum expenditure on social relationships per adult-equivalent member of the household.

Finally, the household's objectives include provision for a target level of surplus, (S), to be used for a variety of purposes.*** The household almost certainly views the future with apprehension: crops may fail or be destroyed, wage income may disappear, or real income may be eroded by unanticipated inflation. Consequently (S) represents in part a cushion against misfortune and error. In addition, the household may wish to increase consumption or ceremonial expenditures beyond that judged to be the socially

* "It is not to be understood that the natural price of labour, estimated in food and necessaries, is absolutely fixed and constant. It varies at different times in the same country, and very materially differs in different countries. It essentially depends on the habits and customs of the people." David Ricardo, The Principles of Political Economy and Taxation (Homewood: Richard D. Irwin, Inc., 1963), p. 47.

** John S. Mill's socially defined concept of subsistence appears in both his discussion "Of Wages" (Book Two, II) and "Of the Stationary State" (Book Four, I) in his Principles of Political Economy (London (: Longmans, Green and Co., 1909).

*** Where S includes some saving, it should not be seen as surplus value. Kerblay (1971: 150, footnote 1) argues all income is viewed by peasants as a product of labour. Hence, they do not have a concept of surplus value nor do they recognise interest as a return to capital.

acceptable minimum; if so, (S) represents the means by which to pursue that objective. Third, peasant households likely derive positive utility from holding and displaying certain forms of wealth. The nature of one's house, female jewellery, and a large herd of livestock would be common expressions of wealth. The household may also wish to accumulate saving for investment in land, physical capital or the education of its members; hence, (S) would represent a fund for investment as well as for the "replacement" of product resources, as identified by Wolf (1966: 5 - 10). For any given household any or all of these motivations may lie behind the objectives of pursuing a target level of surplus, (S).

The concept of household surplus raises several issues. First, are there limits to the amount of surplus a household may accumulate? Effectively, yes. The primary reason is the observed relatively low incomes of peasant households combined with the extent of surplus extraction from such households (Shanin, 1973: 71; Deere and de Janvry, 1979: 607 and 610). Another reason is the pervasive effect of various leveling mechanisms in peasant communities. We have noted already one such mechanism, the need to maintain social relationships. Others mentioned are the limited availability and high cost of credit, (Shanin, 1973: 71) the fragmentation of land holdings via inheritance, (Shanin, 1974: 193) and the extent of resources spent on land disputes (Hunt, 1978: 77). Doyle (1974: 64) also argues the limited bundle of consumer goods accessible to peasants in some localities dampens their consumption horizons. This is especially evident for pastoralists, as their nomadic way of life necessitates a mobile form of wealth, e.g., livestock (Livingstone, 1977: 222 - 223).

A second issue is whether there can be significant differences in the extent of surplus accumulation among peasant households within a community. Dalton argues differences in holdings of wealth occurred within traditional societies; such differences were defined by differences in social status of the various households involved (Dalton 1967: 77). The effect of Western consumerism on traditional societies has been to "democratize"

wealth, destroying some of the social relationships inherent to traditional social systems. Both Lehmann (1982) and Bernstein (1979) argue that social differentiations exist within communities and such differences can be compatible with the continued functioning of peasant units of production. Hunt (1979: 271) provides evidence of this for Mbere, Kenya, citing the experience of those households which had invested in education for some members, who subsequently were able to obtain formal sector employment. Deere and de Janvry (1979: 610) question whether accumulation is part of the objective function of peasants. If it is, they claim it is sufficiently constrained to prevent internal differentiation, within communities, into social classes. Such constraints may well reflect the peasant value set, where economic goals are not ends in themselves; economic activity derives its meaning from the general values of society (Nash, 1967: 8 - 9).

Summarising the above discussion, the household's objectives include the achievement of some minimum standard of material consumption, the maintenance of valued social relationships and the acquisition of a fund of surplus. In the short-term, during which the household's size, tastes, aspirations and social perceptions are all constant and during which prices are known and constant for all goods and services contained in (C), (R) and (S), these objectives may be seen as manifesting themselves in the desired level of household income, (\hat{Y}). That is,

$$(1) \hat{Y} = (C + R) A + S$$

where:

C is the minimum socially acceptable level of consumption per adult-equivalent member;

R is the minimum expenditure on the maintenance of social relationships per adult-equivalent member;

A is the number of adult-equivalent members; and

S is the desired level of surplus.

It will be noted that leisure has not been included in the objectives of the household. There are two reasons for not doing so. First, in peasant-type households the typical trade-off is between

types of work or between more or less work effort rather than between work and leisure per se (Gwyer, 1971). Second, in a society where significant amounts of time and effort are invested in the maintenance of social relationships, the distinction between work and leisure becomes difficult to identify (Doyle, 1974: 63 - 64). Although we do not deny that "pure" leisure may be an objective of peasant-type households, we consider it to be much less important than the other objectives discussed.

It might be considered relevant to specify this objective function in terms of expected life-time earnings. Such a specification would have the advantage of providing a specific present value to a major element of (S). But, as reported by Hutton (1973: 85) for Uganda, virtually all men interviewed expected their security in old age to come from the land they would purchase or the children they would educate with the employment income they hoped to earn. Depending on whether local inheritance practices assure that elderly parents will be provided for by their children, current expenditures on (R) may be necessary as a means of socialising children to accept later responsibility for the care of aged parents. Therefore, the dominant concern of the household is the current time period and the allocation of labour to attain (Y), even though longer-term interests may have some impact on how labour is actually allocated.

Over time the values of (C), (R), and (S) may be expected to change. As indicated above, household preferences and perceptions of acceptable behaviour are shaped by the social, political and economic environment within which the household functions. Public officials, with the example they set, the ideology they promote, the industries they encourage and the policies they implement will surely exercise a powerful influence on individual households. In addition, the future values of (C) and (S) (and possibly, (R) may be affected by current household decisions. For example, a household which plans to dispatch certain of its members to an urban area is likely to perceive a need for schooling these individuals. This decision will affect the composition, and possibly the values, of (C) and (S). Both the experience of schooling and residency in town are likely to have a positive feedback on (C) (Hunt, 1979: 267). Similarly,

changing perceptions of risk or revisions in investment plans will affect the desired level of surplus, (S). Finally, the expansion of markets and variation in prices will affect both the composition and values of (C), (R) and (S) (Doyle, 1974 - 68).

Determinants of Household Income

To achieve its objectives the household must acquire income from its productive activities. Assuming these activities and their output can be assigned prices, income may be accounted in monetary terms even though some is in fact received in kind. The household's immediate concern is with net income: gross receipts less costs associated with the acquisition of those receipts. Prominent among these costs are taxes, rents, depreciation, amortization of debt and the purchase of inputs such as fuel, fertilizer, insecticides and improved seeds.

There are two reasons for the exclusion of labour as a cost of acquiring income. First, the peasant-type households considered here do not as a rule employ wage labour.* Second, following Chayanov's description of the European peasantries, household labour is not a "cost" of production. To be sure, household labour does involve effort -- even drudgery -- and a sacrifice of time which might have been devoted to some alternative use. In this sense, household labour is not "free". But, the household does not view the use of its labour as an accountable cost of production. Indeed it is this attitude which principally distinguishes peasant-type households from commercial enterprises.

In the short-term during which it is difficult to alter the use of non-labour resources, net income earned from any one activity is simply the amount of household labour involved in that activity times the average net return to labour from that activity. Although the amount of labour available to the household is a function of its size and age composition, these factors may be considered fixed in the short-term and the total amount of labour

* The reasons why labour is not employed extensively are not well understood. Possibly wage employment is seen as contrary to the existing pattern of social relationships. An alternative hypothesis, proposed by Hunt (1978: 64 - 65), is the existence of a management constraint within peasant households.

available is given by (L), the number of adult-equivalent labourers in the household. Where land is not a constraint, labour availability, especially during peak seasons of the agricultural cycle, becomes the operational constraint to peasant farm production (Heyer, 1971).

There is much evidence that rural households derive income from a variety of activities. Depending on the particular circumstances which confront the household under study, the number of income sources may be large or small. For illustrative purposes, we here define total net income accruing to the rural household (Y) as:

$$(2) \quad Y = Y_a + Y_n + Y_e + Y_r - \sum_i E_i$$

And more generally,

$$(3) \quad Y = \sum_j L_j W_j + \sum_r \beta_r L_r W_r - \sum_i E_i$$

where:

Y_a is household income derived from agricultural activity undertaken by household members minus the cost of inputs obtained to produce that income;

Y_n is household income derived from rural non-agricultural activity undertaken in the local area by household members minus the cost of inputs obtained to produce that income;

Y_e is income derived from household members employed in local activity not organised by the household;

Y_r is the net change in household income caused by the emigration of one or more members. Included are net remittances received by the household, the net value of saving brought to the local area by returning members and any reduction in household consumption less any change in output caused by the absence of members;*

$\sum_i E_i$ is the sum total of surplus extracted by others from the peasant household;

* Parents may promote emigration because they derive satisfaction from seeing a family member enjoy a higher standard of living in an urban area even though insignificant remittances are returned. This possibility of a psychic return to parental sacrifice is recognized but not incorporated explicitly into the model.

j is the set of activities a , n and c ;
 L_j is the number of adult-equivalent labour units engaged
 in the j th activity;
 W_j is the average return per adult-equivalent labour
 unit engaged in the j th activity; and
 $R_T = Y_r / (L_r W_r)$.

Two issues in this summary statement on sources of income require further elaboration: the content of (E) and the role of minimising risk. According to Lehmann (1982: 149), surplus extraction occurs whenever peasant households interact with other social classes. Deere and de Janvry (1979: 607 - 608) have enumerated seven forms of surplus extraction: 1) required unpaid labour on landlord's estate to gain use right to some land; 2) rent in kind; 3) payment of wages below the value of the labour contributed; 4) extraction via adverse terms of trade; 5) usury; 6) rent in cash; and 7) taxation. Not all forms of surplus extraction need be present in all cases nor are they all of equal importance in each case. But, within the literature on peasants, there is rather broad agreement that peasants share the burden of supporting other classes or groups in the larger society.

With reference to risk, the perceived values of (W) are of paramount importance to the household. Since these values can be known only ex post, decision-making ex ante is subject to risk. Moreover, the degree of risk is likely to vary from one activity to another.

Consider for example, those activities in which household labour is employed by others (sources of (Ye) and (Yr)). Any one of these activities might be viewed ex ante as yielding a constant average net return equal to the prevailing "wage" which the household correctly believes to be independent of its own decisions. In fact these net returns depend on supply and demand conditions in the appropriate labour markets, regardless of how those markets are structured (e.g., competitive, monopsonistic, etc.) Since labour markets are usually in flux, risk is attached on the household's perception of these average net returns. In general, activities located outside the local area (sources of (Yr)) are likely to have a greater variance around an expected net income than is the

case for activities centred in the local area (sources of (Ye)) concerning which the household is better informed. Such an interpretation of risk is central to much of the recent migration literature (e.g., Todaro, 1969; Todaro, 1976; Stark, 1976).

Average net income from economic activities organised by the household (sources of (Ya) and (Yu)) is also subject to risk. Both output prices and non-labour costs of production are crucial in the determination of these (Wj's). To the extent that expected prices and costs are not realised ex post, net income will be subject to risk. Average net income is also dependent on labour productivity which may be changed unexpectedly through the exigencies of weather, pestilence or other "Acts of God". Moreover, the household may experience a diminution of average productivity, and thus declining average net incomes, if additional household labour is employed in particular activities in which other factors (e.g., land) are fixed.

For all these reasons, the household's ex ante evaluation of net income from different activities is subject to risk and uncertainty. Over time the household may be able to increase labour productivity and/or diminish risk through judicious investment and adaptation of new production techniques.* But in the short-term, the household can only attempt to guard against risk through the careful estimation of the (Wj's) and the use of its surplus fund, (S), as a buffer against misadventure.

*Hunt (1979: 251) summarises the literature on risk aversion by peasant households as follows: "(i) the poorer the peasant household the greater the proportion of resources devoted to minimal survival strategies; (ii) priority to subsistence production forms the main component of peasant risk averting strategies; (iii) peasants respond to relative price changes in the same way as capitalist farmers when they produce for the market. Subsistence production is not price responsive."

The Allocation of Household Labour

The allocation of household labour is constrained in two ways. First, the household cannot allocate more labour than it possesses. If some members are exempt from activity for reasons of health, age, sex or in order to pursue other valued objectives such as schooling, then the household has less than L to allocate. That is,

$$(4) L > (\sum_j L_j + \sum_r L_r).$$

The allocation of labour may also be constrained institutionally. On the one hand, the household may face insurmountable external constraints which proscribe certain activities. For example, if the household cannot gain access to land, (Y_a) is not an option for the allocation of its labour. Similarly, law, social custom or an inability to accumulate capital may preclude the household's participation in rural trade or handicrafts (Y_n) . On the other hand, the household may hold strong views as to the dignity or social acceptability of certain activities. For example, a household may simply refuse employment in activities organised by others $(Y_e \text{ and } Y_r)$. In either case, the relevant (L_j) 's are arbitrarily zero in equation (4) above.

Operating within such constraints, the household attempts to acquire a total net income equal to the desired level of household income as set out in identity (1) above. Symbolically,

$$(5) Y = \hat{Y} = (C + R)A + S$$

In the unlikely event that $Y > \hat{Y}$, the household faces an "embarrassment of riches" and may choose to reduce its work effort, to pursue additional consumption or saving, or to make additional investment in human or physical capital. If net income is less than desired income $(Y < \hat{Y})$, then the household will be disappointed and will re-assess its labour allocation. The latter is much more likely because: 1) over time \hat{Y} can be expected to increase, particularly in rural communities where formal schooling is considered desirable and where contact exists with urban areas either through trade or past history of rural-urban migration; 2) given the degree of uncertainty involved, both in African agriculture and in Africa's labour markets,

(Y) will vary considerably; and 3) peasants have little control over (E), the extent of surplus extracted.

For such households a number of strategies may be pursued separately or simultaneously. Where land is accessible, the preferred approach is to increase the work effort applied to land. This might involve a reconsideration of the prior decision to exempt members from work and in general to require all household labour to work longer. But, there exists some absolute limit to the amount of labour which can be generated in the short-term without endangering the health and productivity of household members. In any event, the amount of extra labour generated from such increased "self-exploitation" is likely to be small, and if average net returns to labour are miniscule, then even the fullest possible utilisation of household labour need not ensure that $(Y = \hat{Y})$.

In addition to the possibility of a continued $(Y < \hat{Y})$, African peasant households have experienced an increasing need for cash income, both to meet such household needs as school fees and to pay the various forms of (E). One means to cash income is to grow cash crops. The literature on peasants identifies crop selection priorities. Given the strong desire to minimise risk, staple foods for household consumption take first priority (Medani, 1972: 66; Bernstein, 1979: 425 and 429; Deere and de Janvry, 1979: 606; Hunt, 1979: 279 - 280). Also, where competing demands for labour between food staples and cash crops exist, the planting and weeding of food crops will be done first (Heyer, 1971: 64 - 65; Doyle, 1974: 65). Another crop selection strategy designed to reduce risk is to grow a cash crop which has 'use value' for the household. This provides the household with the opportunity to consume the cash crop should its staple food crops fail or should the market price for cash crops decline significantly. Finally, inter-cropping, rather than growing pure stands of any one crop, can serve to reduce the likelihood of total crop failure.

In general, subject to the above mentioned constraint of minimising risk, African peasants are seen to be responsive to relative prices among cash crops and to changes in crop prices (Medani, 1972: Doyle, 1974: 62; Hunt, 1979: 251). It is the larger, wealthier peasant farmers, who have the ability to bear

some risk, who can experiment with new crops and new technology, and who can grow pure stands of those cash crops with little or no 'use value', provided the price is right.

An alternative means to additional income and/or cash income is to pursue non-agricultural self-employment or wage employment. Whereas previously the household might have tolerated an "uneconomic" situation in which, for example, ($W_a < W_n$), the household must now consider shifting some labour out of agriculture (W_a) into non-agricultural activities (W_n or W_e). Even though both total net income and cash income would increase as a result, such a re-allocation would involve some cost, even if only in the form of overcoming inertia and past practice. And, of course, the household's ability to shift labour may be severely limited by non-labour resources at its disposal or by some institutional constraint on the use of its labour.

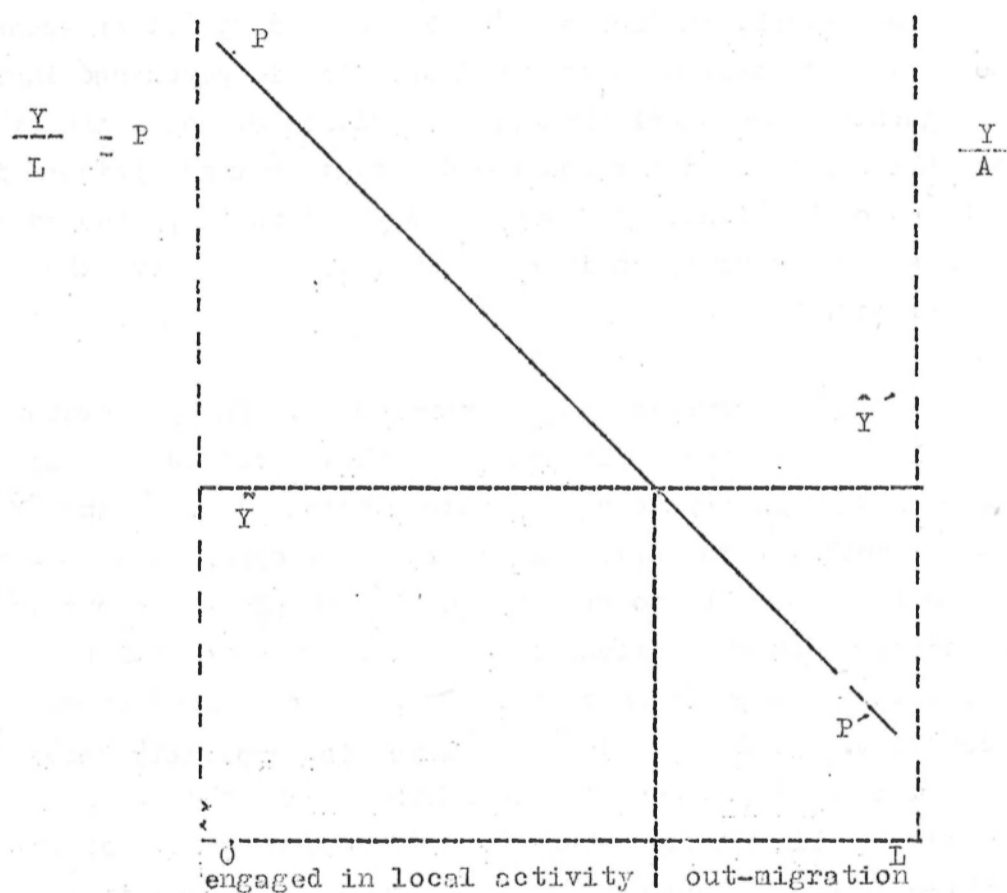
Where some form of wage employment is now common practice in many peasant households in Africa, less is known about which households are the most likely to seek wage employment. A Latin American case study shows the majority of the landless (share-croppers) and small plot holders had at least one labour market participant (Deere and de Janvry, 1979: 605 - 606). For larger peasant farmers, only one-third had a household member engaged in wage employment. For the former, eighty per cent of gross income was derived from wage employment or from cash crops, even though they devoted a smaller portion of their land to cash crops than was the case for the larger farms. The propensity to seek wage employment increases whenever adverse conditions, such as droughts, strike agriculture. This is why we observe in contemporary Africa what Chayanov observed in the Soviet Union during the 1920's: wages decline as grain prices increase*.

A third possible strategy for peasant households involves reconsideration of previously held objections to particular types of economic activity. Suppose for example that a particular house-

* According to Hunt (1978:78), this was less evident in Mbere, Kenya than Chayanov would suggest because peasants in an adverse agricultural situation, who sought temporary employment in neighbouring locations, were generally paid in kind, e.g., maize.

hold initially refused to consider urban unemployment for some of its members even though net returns (Y_r) would have exceeded average net returns in acceptable activity. Then clearly, total net income would be increased by dispatching certain members to seek employment in urban centres. Since this requires abandonment of strongly held views, it is likely to be resisted, and given the greater risk attached to the value of (W_r), the implementation of this strategy would be all the more difficult. Nonetheless, for many peasant households rural out-migration has become necessary.

Figure 1 provides a more formal presentation of the allocation of household labour between local activities and external places of employment.* The horizontal axis in Figure 1



* For an extended discussion of a micro-level migration decision-making model see Henry Rempel, Rural-Urban Labour Migration and Urban Unemployment in Kenya (Laxenburg: International Institute for Applied Systems Analysis, 1981), pp. 2 - 20.

measures the number of adult-equivalent members of the household labour force. Household aspirations (measured as Y/A on the right axis) is shown by $\hat{Y}\hat{Y}$ and is to be interpreted as the level of income per household adult-equivalent required to meet the goals and aspirations of the total household. As we are not able to distinguish differences in aspirations among the units of labour inputs, $\hat{Y}\hat{Y}$ is shown as a horizontal line. Its position will change every time the amount of income per adult-equivalent needed to meet household aspirations changes. The line PP' plots the average productivity of household labour. Assuming diminishing returns are experienced at the margin, the line PP' slopes down to the right*. Since family income is shared according to tradition in a peasant-type household, the average rather than the marginal product of labour is relevant for measuring the supply of labour available for use outside of the community (Gugler, 1975).

In general, an increase in (Y) caused by better transport to facilitate selling output and bringing in purchased inputs, labour augmenting technical change, acquisition of more land or a favourable shift in either household output or input prices will shift PP' to the right. A downward movement in (Y) , caused by any of these forces or by an increase in (E) , would have the opposite effect.

Figure 1 shows the most general case. The proportion of household labour seeking employment or employed outside of the local community will depend on the intersection of PP' and $\hat{Y}\hat{Y}$. One extreme would be the situation where local opportunities were significantly favourable to generate a PP' completely above $\hat{Y}\hat{Y}$. In that case, no out-migration would occur. An alternative extreme, caused by severe land shortages, natural disaster or armed conflict, would generate a PP' which is completely below $\hat{Y}\hat{Y}$. Such a situation would leave the household little choice other than a move of all of its members in a desperate search for some alternative means of income. Such migration is evident in the Sahel, Ethiopia and Sudan and accounts in part for the large number of refugees located in various parts of Africa.

* The left, vertical axis of figure 1 is broken at the bottom because of difficulties involved in specifying the output of the marginal unit of labour. If labour productivity is defined by the labour inputs required over an agricultural cycle, then zero marginal productivity of labour is not considered applicable in most rural areas.

Seasonal migration, provided such opportunities exist, has the dual advantage of leaving family members within the home social network while supplementing household income with outside earnings during a temporary absence. The actual value of maintaining these larger social networks is difficult to evaluate because seasonal migration also provides the economic advantages of enabling the household to maintain most of its local production and of avoiding maintenance costs for the household in the destination area.

If the household chooses to dispatch a member on a longer term basis to employment opportunities outside of the home area, the resulting relationship is bound to take the form of one family maintaining two places of operation as identified by Weisner (1972) for Kenya. Initially the migrant will be assisted by the members remaining behind and/or relatives and community members who have preceded the migrant. When the migrant has become established the household will benefit from remittances or periodic gifts plus, on the migrant's return, what she/he has been able to accumulate. The larger social network has facilitated the move; the same network is the beneficiary of the results generated by the move. Should the move prove unsuccessful, the migrant can fall back on the household which shares the cost of the venture.

The return to the household from such out-migration is dependent in large part on the type of migration the household can afford. The available evidence indicates remittances are most evident in international migration, less so for rural-urban migration, and least evident in rural-to-rural migration (Rempel and Lobdel, 1976). The costs involved in financing international migration typically are substantial, and if household members have only limited employment qualifications with which to compete for available formal sector jobs in the towns, then a household may have to be satisfied with sending one or more family members to some alternative rural area.

The observed rural-to-urban migration tends to reflect previous migration by others from an area to a particular destination, who provide contacts and can serve to reduce significantly the costs of job search, and hence of migration (Rempel, 1981: 63, 68 and Ch. 7; Lehmann, 1982 : 140 - 141). As a result,

out-migration is more likely to be considered as an option in household labour allocation if the village already has established a "beachhead" elsewhere than will be the case if out-migration from the area is a new phenomenon. Also, the extent of contact between migration source and destination areas in the form of trade, and as facilitated by good transport links, will induce out-migration in that awareness of the alternative will reduce the cost of the move and may stimulate aspirations and hence raise the household's (\hat{Y}) .

Finally, the out-migration observed is quite selective among household members. Positive selection factors include the younger members, who are less likely to be tied down with family responsibilities and who can expect to obtain a larger life-time return from migration than older members, and the better educated, who may have above average aspirations and who are more likely to succeed in obtaining urban employment. A negative selection factor is between the sexes. The social structure that has evolved in many rural areas in Africa has men exercising control over women, to whom has been relegated primary responsibility for all aspects of household reproduction, including production and preparation of the staple food crops, storing food supplies between harvests, and maintaining a stock of seeds (Meillassoux, 1973). With this primary rural responsibility placed on women, men are much more likely to move to towns than women.

Summarising the above discussion, these various strategies whether pursued singly or in combination are not necessarily sufficient to close the gap between (Y) and (\hat{Y}) . It is even possible that the pursuit of these strategies will increase that gap. A strategy of self-exploitation, for example, may entail an increase in (C) in order to sustain labour productivity; hence, the gap may be widened. The re-allocation of labour may involve additional non-labour costs and may act to raise household aspirations. This is especially noticeable if the re-allocation involves out-migration or the formal schooling of household members. The point here is simple: these adjustment strategies cannot assure the attainment of some equilibrium state in which $(Y = \hat{Y})$ and indeed

may result in divergence from that equilibrium because the level of (\hat{Y}) is affected by the struggle to obtain the desired equality between output and aspiration levels.

III. SOME POLICY IMPLICATIONS OF THE MODEL FOR RURAL DEVELOPMENT

The core of any rural development strategy is the development of agriculture. Agriculture, as a sector, is expected to carry out a variety of national functions: 1) provide a growing supply of food and raw materials for the economy; 2) provide a growing supply of labour for non-agricultural activities; 3) provide a growing market for industrial output; 4) serve as a primary source of savings; and 5) generate foreign exchange.

For peasant agriculture in Africa, function 4) is of primary importance, with function 5) playing a secondary role.. As the bulk of the population is rural, function 1), peasants providing food for themselves, has been taken for granted. During the colonial period various coercive measures were necessary to assure even the limited supply of labour required. In contemporary Africa the role has been reversed, peasant agriculture is expected to 'hold' and feed the reserve army of potential employees until they might be needed in the formal sector (Meillassoux, 1973: 89 - 90; Hill, 1978: 26). Function 3) has remained largely ignored in Africa.

To expand the capacity of peasant agriculture to provide savings and foreign exchange, public policy has been pre-occupied with supposed supply constraints to expanded agricultural output. This is not surprising, given that peasants were valued primarily for the surplus that could be extracted from their productive efforts.

With the emerging contemporary interest in peasants as a means of meeting Africa's growing food problem, some attention is being directed to the demand side of agricultural production. One source of this attention is the international creditors; the growing food imports are a threat to the ability of countries in Africa to service their respective debts. Similarly, the developed country importers of agricultural goods are becoming

concerned that a food crisis within African countries will threaten their sources of low cost agricultural commodities.*

Such international concerns are now generating considerable pressure for significant macro-level reforms within African countries. Common components of such macro-reforms are: 1) remove domestic price controls on food; 2) reduce the level of taxation on agriculture, both explicit (excise taxes) and implicit (e.g., over-valued exchange rates); 3) reduce or eliminate the role of the state in the agricultural distribution system; and 4) reduce the extent of effective tariff protection in various parts of the industrial sector. This advice is premised on models of behaviour for commercial farmers; these are the only farmers known to developed country advisors.

The successful implementation of this policy package would serve the interests of the international community: both creditors and importers. It would also threaten the existing political structures throughout much of Africa. The nature of such a threat would include: 1) the ability to extract surplus from peasants would be eroded; 2) the cost of 'holding' the reserve army of potential employees would increase; 3) the wage costs of production would increase; and 4) the ability of peasants to challenge the political system would increase.

In the past the power of the peasants has been limited primarily to their ability to withdraw from the market (Shanin 1971: 254; Hill, 1978: 26 - 27).** To counter this power of peasants, Hill argues that African states invested large sums of money in agricultural schemes (Hill, 1978). In many countries such schemes took the form of state farms; in the Ivory Coast and Kenya it took the form of loans and investment incentives which enabled individual members of the "public-sector bourgeoisie" to purchase land. The political effect of these different approaches has been similar. The generalised price increases for farm output promoted by external sources would not solve the inefficiencies

* Even though Sub-Saharan Africa has a food crisis, as identified in the opening paragraphs of this paper, it is a net exporter of food (excluding food aid). World Food Council, 1983: 6).

** At times of national crisis, to assure peasant support, governments have been known to carry out some agrarian reform, making more land available for use by the peasants.

common to these agricultural schemes, but would strengthen the peasant farmers. The result could be a serious challenge to the existing class interests of politicians and top-level government administrators.

Rather than open a political 'Pandora's box' with a shotgun approach to Africa's food crisis, a preferred approach would be a set of specific policies that can be implemented within the current political systems, will serve to provide greater food security, and will build on the strengths of the peasant household system while encouraging and enabling it to become more productive.

A starting point is price policy. For peasant farmers, as a means of minimizing risk, price security is of prime importance. Price security includes: a clear indication of what price will be paid, a definite commitment that the announced price will be paid in full at delivery, and an assurance that market delivery of farm output will be possible. Should the government desire to affect planting as well as marketing decisions, the relative prices of the various farm outputs need to be announced before planting decisions are made.

Such a price policy places some risk on the government as it will need to absorb all output placed on the market. Under current marketing systems, when excess production occurs, governments have been known to not pay the full amount, to delay payment, or to simply reject part of the farm output delivered, and thus force the cost of excess production back on to the peasant farmers. A possible, longer-term solution would be a regional food agreement among African countries, where temporary surpluses could be moved to countries in need and where staple foods could be obtained whenever shortages occur, either because of drought or because the announced price was too low.

Within any one country, a means to reducing the costs of a food security program, yet addressing the needs of those groups at greatest risk, would entail limiting price controls to the staple foods of the low income groups in society. Similarly increasing the producer price of such staples, relative to the price of other farm outputs, will increase the supply of low-income staple foods.

Re-directing research resources and extension services toward such staples would serve to increase the yield per hectare and reduce the gap between the producer price and the consumer price.

This approach to food security could serve to draw in the smaller, poorer peasant farmers as it would minimise their risk of producing for the market and would open the possibility of increasing their productivity. Given that women take primary responsibility for these staple food crops, the research needs to grow out of their experience and the extension services need to be directed toward women. The research and extension should cover the storage and preparation as well as the production of these staple foods.

The need to develop appropriate technology is a general problem in Africa. Given the high degree of dependency on external sources of new products and technology, the indigenous capacity to invent and innovate is very shallow. Internally, the economies are characterised by a high degree of dualism, which limits the potential for backward and forward linkages between the agricultural and the industrial sectors. Finally, given the strong desire to minimise risk, peasants show a distinct hesitancy to adopt any technology which may increase the variation in the quantity of output, create a dependency on externally supplied inputs, or interfere with the production of a basic supply of staple food crops.

The industrial capacity to address the emerging technology needs of small farmers opens up the possibility of realising the development success achieved in Denmark, Japan and Taiwan. To develop such capacity several policy options will need to be considered: 1) a selective de-linking from those transnational corporations that keep injecting inappropriate products and technology; 2) an active land tenure policy which facilitates the ability of peasant farmers to develop their land yet effectively constrains the establishment of either large state or private farms that rely on imported inputs and substitute scarce capital for abundant labour; 3) eliminate all explicit and implicit subsidies for imported farm machinery or for capital intensive

technology; 4) develop the research and learning capacities needed to invent and implement indigenous technology; and 5) actively work to spread proven technology among peasant farmers.* Establishing mechanisms of vertical integration can reduce the risks to individual farmers of adopting new technology or of specialising somewhat on a particular cash crop (Kerblay, 1971: 158 - 159; Bernstein, 1979: 429 - 430).

A final, more general policy thrust would be the provision of rural infrastructure. Such expenditures have taken on a variety of forms, including educational and health facilities, improved communications and transport systems, public housing and the provision of recreational facilities. The objectives of such a strategy are to lay the foundation for improved rural productivity and to encourage the growth of intra-rural sectoral linkages.

In so far as public expenditures directly employ household labour and to the extent that average net returns from such employment exceed returns from alternative employment, then total income will increase for the affected household. Moreover, if rural public expenditures create new markets for rural output, then average net returns to labour in a wide variety of occupations will increase somewhat.

At the same time, such public expenditures may act to increase the household's minimum socially acceptable level of consumption as new goods and services are now perceived to be both necessary and available. Of course, this need not necessarily be disadvantageous so long as the household is able to meet its higher aspirations through a reallocation of its productive resources, especially labour. If, however, this newly created (or enhanced) income gap cannot be closed, then households may feel disenchanting and resentful, and as a result may be "forced" to choose out-migration in an effort to remedy their situation.

The above set of policies may be difficult to implement in that peasants tend to distrust government initiatives. A long

* Shapiro (1983) reports substantial productivity differences among cotton farmers in the Geita district of Tanzania. It is possible such differences primarily reflect differences among farmers in their ability to bear risk, and hence differences in the relative priority they give to working on their staple food crops versus cotton.

history of being subjected to surplus extraction, with limited government services in return, causes peasants to question the intent of any policy action. One approach to overcoming this distrust would be to decentralise both tax collection and decisions on government expenditures. In this way peasants would have the opportunity to make some input into how public money is spent and they would be able to seek the benefits available to them from the taxes they have paid.

IV. CONCLUDING COMMENTS

The underlying premise of this paper may be stated simply: rural household decision-making among African peasants is a rational process in which complex objectives are pursued within a set of constraints. The model attempts to describe one aspect of such decision-making, namely the allocation of labour by peasant-type rural households whose behaviour characteristics differ fundamentally from those of profit maximising commercial entrepreneurs.

It is expected that the application of this model to various aspects of rural development will yield a set of hypotheses at least some of which are not derived from alternative analytical frameworks. A correct understanding of rural development problems, and hence an ability to formulate overall development policy, necessarily requires a realistic model of rural household decision-making. We believe that the present model is a step in that direction.

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