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THE OUTFLOW OF LABOR FROM AGRICULTURE: A FRAMEWORK FOR ANALYZING MIGRATION FROM RURAL AREAS

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ABSTRACT

This paper examines the context and determinants of rural migration with particular emphasis on the interaction between demographic and agricultural-related variables. Migration is one of the demographic phenomena which has both consumption and production overtones, and is a family rather than an individual decision. Consequently, the operation of the family as a decision-making unit has received special emphasis in this paper. The decisions and the choices open to the family are constrainted by the setting within which she lives. The setting is described by three sets of variables at the village level, that describe level and pattern of labor utilization, level of agricultural technology, and village's environment which is defined to include two groups of variables; those describing level and distribution of resources within the village and those describing the extent of the village integration into the outside world. It is argued that while the setting determines the volume of migration, the individual's propensity to migrate is influenced by the socio-economic position of the the family, and type of family organization and strategy.

A two-level analysis of migration (at the village level and at the household level) in villages of different settings is therefore needed, in order to capture the different patterns of causal relationship between variables on one hand while increasing the policy relevance of the results on the other.

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THE OUTFLOW OF LABOUR FROM AGRICULTURE

A Framework for Analyzing Migration from Rural Areas

1. GENERAL INTRODUCTION

Evidence on rural migration is a primary means of demonstrating the geographical mobility of labor. The large number of migration studies, conducted in a variety of countries, consistently attest to a high degree of labour mobility, which, moreover is motivated in the main by economic factors. The studies also reveal that migrants are concentrated in particular subgroups of the population and, contrary to some popular views, obtain employment at their point of destination relatively easily. This paper discusses the determinants and context of rural migration with particular emphasis on the interaction between demographic and agriculture-related variables. To put the subject in perspective, we begin by a "general" review of the basic theories of internal migration and some empirical findings.

During the past two decades, scientists of several disciplines have been attracted by the phenomena of distribution and redistribution of people over space and have sought for explanation. Planners, demographers, economists, geographers and scciologists have addressed migration-related questions. Who migrate? Why do people move? What are the patterns of flows and directions of migration? What are the consequences

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of migration? Demographers have typically looked upon migration as a component of population change; economists have examined it as a mechanism enabling an individual to adjust to new situations and enabling the labour market to adjust when disturbed from its equilibrium positions; geographers have been primarily interested in the description and explanation of the spatial patterns of mobility; and sociologists have focused on the study of motivation, of the relation between migration and social structure, and of the assimilation of migrants in new communities.(1)

In contrast to the extensive enquiry on internal migration, which was mainly empirically oriented, little effort has been devoted to the synthesis of this fragmentary knowledge into a general migration theory. Usually, two approaches have been followed in the construction of a migration theory (Willekens, 1977). The first, inductive, approach attempts to build up a migration theory from empirical observations. The second, deductive, approach starts from a general theoretical construction and collects empirical evidence to prove its applicability. It is not surprising that most researchers have followed the inductive approach. Recently, under the stimulus of economist, the duductive approach seems to be gained in importance. The framework which will be discussed in this paper leans towards the first (inductive) approach.

Theoretical explanations of rural-urban migration have a long history, dating from at least the 1880's when Ravenstein (1885,1889), following an empirical study on population movements, formulated the observed empirical regularities as "laws

of migration". The importance of the economic motive, the negative influence of distance and the role of step-migration were some of the features of Ravenstein's approach which have survived most attempts at reformulation. Among those who have amplified Ravenstein's law is Lee (1966). Lee has introduced a broad theory for considering the social factors influencing migration. He hypothesizes that each origin and destination has a set of positive and negative factors attracting and repelling migrants. The greater, the differences among these factors, the higher the probability of migration. Increased diversity and specialization among the people in these areas also increases the volume of migration. On the other hand, intervening obstacles limit migration to those people capable of overcoming these difficulties. Combining all factors, Lee concludes that migrants responding to plus factors at the destination tend to be positively selective (i.e., more mobile by virtue of age, education, or experience) and that migrants responding primarily to minus factors in the origin tend to be negatively selected. Thus migration selectivity tends to be biomodal. Many studies particularly those dealing with migrant selectivity and push-pull factors are based on Lee's broad theory.

The present status of the theory owes much to the recent work of Todaro (1969) and Harris and Todaro (1969). Todaro quantifies economic motives in terms of perceived rural-urban income differentials, assuming that migrants seek to maximize future earnings. Todaro's formulation helps explain high rates of migration to areas of high unemployment. Migrants who have

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a long time horizon balance the expected period of unemployment against the higher incomes they expect to receive when they do find a highly paid modern-sector job. If the perceived income differential is large, young migrants may easily justify lengthy periods of unemployment. In effect, this is a cost-benefit model of migrations stressing only the so-called pull factors.

Pull factors shape the directions of migration flows but they cannot, by themselves, explain the volume of out-migration from rural areas.(2) In a comment on the Todaro (1969) model, Bhattacharjee (1974, p. 257) points out:

> "The point is that where the push factors are decisive in throwing out people from the rural areas, the migration process may be said to have already started and the pull factors such as expectation of higher incomes and probability of getting jobs are relevant, perhaps, in decisions on where to go, as between small towns and large metropolitan areas."

Migration and the accompanying period of unemployment or under-employment may also be viewed as an investment eventually returning a higher income and level of living to the migrants. Sjaastad (1962) was the earliest to explain the migration process in terms of human capital theory. According to him potential migrants weigh the costs against the expected returns of migration, e.g., income losses and social or economic moving costs versus higher status and income, improved level of living, and better education for children. If the expected returns are greater than the perceived costs, the individual or family moves, choosing a destination that will maximize the returns on the migration investment. This human investment approach better

explains why younger persons dominate migrant flows (Findley 1977). The young persons often lack occupational experience and have little or no current income, their opportunity cost of moving is lower.

Not only migration involves investment but it involves risk also. It is only those withrisk taking ability leave their origin even if the costs and returns of migration are assessed equally by two individuals. This element os risk has been considered by several researchers including, among others Lee (1964) and Maboguije (1970).

The analysis of push factors and the general characteristics of migrants with special reference tc the agriculture sector will be delt with later, here we will end this section with a brief discussion of the general format of the single-equation migration model used in a vast number of studies (Willekens, 1977).

In these models, the single equation has the form:

$$Mij(x) = f (Zi, Zj, dij, h(x))$$, where

Mij(x) denotes the migration of persons of category x from region i to region j,

Zi, Zj denote the characteristics of the areas of origin and destination, respectively,

dij represents the friction or intervening factors, and h(x) is an expression for the personal characteristics of the migrants of category x.

This is a general format, because it includes both pull and push factors and can be made to consider either factor

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separately. The econometric specification of this equation and its variaties, together with a discussion of both different dependent and independent variables used are reviewed extensively in Todaro (1976) and Yap (1975).

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2. A VIEW OF MIGRATION SPECIFIC TO THE AGRICULTURAL SECTOR

A limitation of the above theoretical framework is that it is general. It could apply to any individual or to any sector of the economy. Yet, the strongest migration movement is out of agriculture or from the rural to the urban areas. This phenomenon, the so-called urbanization or, more accurately, the demographic aspect of it, has come to be empirically correlated (up to a certain level) with the level of development as the exoeriences of advanced contries show. Historically, development has come to be identified with shifting the center of gravity of a population and its economic activities from primarily agrarian to urban, industrial-service oriented areas. In simplified development models internal migration would be treated as sectral labor transfer and it is usually assumed to respond to inter-sectoral (or inter-regional) wage differentials. Kaneda (1979) has emphasized the distinction between the inter-sectoral and the inter-regional flow of resources. Rural to urban migration of labor is only one way of inter-sectoral flows, in the process of economic development and structural change, other forms do not necessarily include locational change as migration, Kaneda (1979). The other form of outflow of labor may take the form of off-form employment either as hired labor in "other" farms in the area or in some non-agricultural activities, in the same village or a nearby one (i.e. multiple occupations in households). These two forms of the outflow of labor from agriculture, off-farm employment and rural-urban migration represent a form of relieving population pressure on the land (Muller, 1976). This will lead us to the single

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"push" factor which has received most attention in the literature namely, the rural over population. We will not deal here with the definition of over, under or optimum population but we will follow Willekens (1977) in considering two approaches to over population:

a) The relation between population and the carrying capacity of the land (i.e. food supply); and

b) The relation between population and absorbing capacity of the agricultural labor market (i.e. labour demand).

The first approach is typical for ecological studies, whereas the second one represents the economist's viewpoint.

In traditional societies, population distribution is closely related to agricultural technology. The factor determining the carrying capacity is the natural productivity of the ecosystem. As the population pressure increases, i.e. the land/man ratio drops, people are pushed to exoand the productive land or to move to new areas.(3) This ecological push is very important in primitve societies. In India, for example, most out-migration from Ganga Plain and some other areas can be attributed to the high population density as compared to the agricultural productivity (Gosal and Krishan, 1975).

A varient of the ecological push is seasonal migration. The volume of seasonal migration is considerable, in particular in West Africa. Mabogunje (1975) estimates that about two million people are involved in this movement in West Africa and one million in Nigeria. Classically, seasonal migration is controlled by an extended period of low labour demand in the

home village, combined with alternative and accessible labour demand elsewhere. Most seasonal migration is rural-rural and dependent on complementary peaks of labour demand; as a result, cropping pattern can be vital. With continuous cropping (and some form of cash-cropping, notably irrigated rice), demand for labour may be intensive, but it does not have marked seasonal peaks over the year. Seasonal demand for labour not only reflect cropping pattern but also the technology; where agricultural modernization is labour-replacing and restricts the demand for even peak-season, rural-rural migration is markedly rare (Connell et al, 1976). For a detailed discussion of seasonal variation in labor utilization and the various measures that are adopted by cultivators to cope with peak demand for labour, see (Dasgupta et al., 1977 pp.49-65).

The seasonal migration which is an adjustment to the change in demand of agricultural labour market is important to consider because what starts out as seasonal migration may become a permanent one. Not all labour leave the agricultural sector because of inability to subsist on the family farm. In addition to the pull of urban opportunities and the rural-urban wage differentials, farm youth may be pushed out of the agricultural sector by the slowly rising aspirations which accompany agricultural progress as it happened in Japan and Taiwan during most of the twentieth century (Muller, 1976).(4)

In most developing countries today, the rural over population problem has received a new dimension. A number of agricultural policies of developing countries (and foreign aid

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policies of donor countries, Willekens (1977)) tend to aggravate rural unemployment and to stimulate out migration. The most important is the premature industrialization of agriculture, include excessive mechanization. This emphasis on capital-intensive agricultural development projects leads Todaro to conclude:

> "By over-emphasizing direct government production schemes that are heavily capital-intensive, include state farms land settlement and irrigation projects, policy-maker have failed to recognize the tremendous potential absorption capacity of the agricultural sector, for its own rapidly expanding rural work force... . As the population grows and large-scale mechanized farming schemes are indiscriminately promoted, more and more persants stands to loose their land and be pushed out of any participation in the rural economy." (Todaro, 1974, pp 162 and 164).

There is no doubt that any change in the level of agricultural technology (be it mechanization, or introduction of new seeds variaties, the so called green revolution, or both) and/or the extent of commercialization of agriculture has profound effects on the level of out migration through their effect on level and pattern of labour utilization at the village level.

It is the working hypothesis of this paper, that out migration from rural areas (especially when we remember that migration is really an off-village employment)is an aggregate response (aggragated at the household level) to change in socio-economic environment ofthe village particularly the agricultural labor market. Further more at the household level, migration of one (or more) of the family's members is a part of a general strategy, regarding the internal division of family labor, designed to help the household cope with the changing conditions.

These points will be discussed in detail later in the paper; here we will only discuss briefly the implications for the level and pattern of labor use (at the aggregate level) that result from change in agricultural technology.

First, the introduction of new seeds both increases the overall use of labor as well as reducing seasonal variation of labour demand, (thus reduces the incidence of seasonal migration). This is due to the need to use complementary inputs like water and pesticides in conjunction with the new seeds which require more labor. In addition, the new seeds usually recuire shorter maturing period, which permits the planting of two or three crops a year. Second, and as a consequence of the increase demand for labor, new seed tend to increase the demand for hired labor and away from the reliance on family labor. This will imply a displacement of women and children by hired workers. The increase in the demand for hired labor together with the "commercialization" accompanying the new variations lead to a decline in the amount of wage paid in kind and a corresponding increase in the cash payment of wages (Ladejinsky, 1970, cited in DasGupta (1977). <u>All this add to one thing: the increase of rural household participation in the agricultural labor market</u>.

This result has both theoretical and practical implications as we shall see later.

Not all factors affecting labor force participation are agriculture-related and we will end this ection by discussing briefly some of the factors, outside the agricultural sector

that affect participation in the agricultural labor force. In general the younger the population (i.e.the higher the proportion of dependents below 15 to total population), the lower the average labor force participation rate. The age composition of the population is then a systematic factor which determines the participation rate. The sex composition introduces another systematic factor. Child-bearing confines women at home for long periods of time. Hence the relationship between female labor force participation and fertility rates is inverse. Migration is crucial too; it reduces man-land ratios to different extends for different sorts of family. Being highly selective by both age and sex, migration also alters the structure of food requirements and of potential work inputs in the farm family.

Non-economic factors, such social customs and conventions, also tend to reduce the labor force participation of females. As income rise, more opportunities for female employment will be created outside the household and within the structural labor markets and this will berecorded as an increase in participation rates. Participation rates therefore are among the demographic variables which cannot be projected in to the future on the assumption that they are exagenous to the level of development. On the contrary, they are determined in the process of interaction between economic and population factors.

3. FACTORS INFLUENCING LEVEL AND PATTERN OF LABOR INPUT AT THE HOUSEHOLD LEVEL

The above discussion has pointed out the necessity of examining migration from rural areas as an integral part of a process that influences and is influenced by the level and patterns of labour utilization at village level. Admittedly, this process and its economic correlates does not completely determine the level of migration since there are other factors social, cultural which may influence it. The next section will be devoted to the discussion of these points in great details. Here we will consider the factors that influence labor use at the household level; this is essential since the decision to migrate is taken, obviously, at the household level.

The operation of the agricultural household as a farm-firm combining production and consumption decisions (an organization of nature peculiar to agriculture) is a characteristic which becomes crucial for the analysis of the decision making process at the household level (including decisions regarding labor utilization and/or migration). Three important implications in this regard have been mentioned by Yotopolus (1978, p. 56).

> "This characteristic has specific implications for the organization of the production process around the members of the family under the direction of the head of the household. It carries over to the distribution of the product among the producer-member of the family by rules other than marginal productivity considerations. Lastly, it makes meaningless the definition of functional shares, since the returns to the family's land, labor, capital and entrepreneurship are inextricably interwoven and can have implications for both production and consumption."

If we seek to understand why labor input, on or off the family farm, is pushed to a particular level, we need to know the household size, composition and structure and any recent change in these, both for the village and disaggregated by occupational, income and landholding groups. A crucial area which is still neglected by researchers (Connell and Lipton, 1977) is the importance of supply side factors undetermining family-farm choices of village participation, work duration and productivities, and the mediation of these factors by land distribution and demography.

To illustrate this point consider the following Table which shows total labor market participation (i.e., the extent of hiring in and hiring out) for agricultural households in Malaysia and Egypt disaggregated by farm size and family size (Squire, 1977, p. 49):

Table 1 : LABOR MARKET PARTICIPATION IN MALAYSIA & EGYPT

Size of farm (a)	Family Labor Force(b)	Off-farm work as a percentage of total work		Hired labor as a percentage of total labor input	
		Malaysia (c)	Egypt (d)	Malaysia (c)	Egypt (d)
Small	Large	43	33	24	6.2
Small	Small	43	18	25	7.3
Medium	Large	28	14	40	10.9
Medium	Small	33	4	48	21.7
Large	Large	16	5	59	28.2
Large	Small	23	3	60	52.9

Notes: (a) Malaysia: small = < 2.1 acres, medium = 2.1-4.3 acres large = > 4.3 acres.
Egypt : small = .5-2 feddan, medium = 2-5 feddan, large = > 5 feddan.
(b) Malaysia: small = < 2 working members, large = 2-4 working members.
Egypt : small = < 3, large = > 3 working members
(c) Data refer to males and females.
(d) Data refer to males only.

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The above table reveals a marked inverse relationship between hiring in and hiring out. Large families with small farms hire a small proportion of their total labor input, but hire out a large proportion of their total labor supply. At the other extreme, small families with large farms hire a large proportion of their total labor input, but offer very little of their own labor on the market. This trend is not unique. Many village studies from both Asia and Africa confirm the higher labor intensity of small farm and the greater reliance of hired labor on the part of the bigger farms (Dasgupta et al, 1977). This pattern is significantly influenced by the availability and distribution of land holdings. In a village with highly skewed land distribution, more land would be in the hands of a smaller number of people, which would both reduce the intensity of labor use and increase the proportion of hired workers in the labor force; the latter trend would be facilitated by a larger supply of agricultural labourers because a high degree of landlessness would accompany such distribution.

The important point here is that the so called "off farm work" usually include work outside the village, namely migration. As a matter of fact, it has been demonstrated significantly that the propensity to migrate is associated with non-availability and skewness of land distribution, although it is not necessarily the poorest who migrates (Connell et al, 1976).

It is clear that although the aggragate level of labor demand and supply is determined, via the wage rate, in the labor market, the actual decisions underlying labor demand and labor

supply are made at the disaggregated level; i.e., at the level of the individual farm for labor demand and at the level of individual household for labor supply. In the case of the farm-household, however, labor demand and supply decisions are made by same entity. It is the aggregation of these relationships which has an impact at the macro level. A micro level analysis is essential, therefore for analysis of the choices (and constraints upon choice), causing the agricultural household to arrive at a particular level of labor input.

The presence of an active labor market in which households (or the majority of them) participate either by buying or selling (or both) labor has an important implications. Theoretically, labor market participation should be (in this case) an important component of models of agricultural household.(5) Empirically, and in that case, household decisions about consumption (including the level of family labor input) can be made independently of household decisions about the level of production. Specifically, the demand for total labor (in hired and family) implied by the amount of output, the household decided to produce, does not imply any particular level of family labor input. Household's preference for leisure (total time available minus total time work, Baruum and Squire, 1979) together with its preference for commodities determine the level of family labor input.

The labor resources of the agricultural household are determined not only by the number and the composition of its members but also by its consumption requirements, and alternatives. Three consumption possibilities may be considered;

retained farm production, market purchased goods and total working time (or leisure). The previous table which shows total labor market participation by size of farm and size of family demonstrates that access to an active labor market ensures that income-earning employment (by hiring out labor) is not constrained by the size of the area operated. The household makes its choice regarding total number of hours worked in the light of its income-leisure trade-off. The added income which result from the additional work depends on how added time is allocated. Thus, the added income will depend on the market wage if the additional time is sold on the labor market or on the conditions of production (wages, technology and price of output) if the additional time is applied to farm production. In turn, the actual consumption pattern followed with respect to the additional income generated, depends on the price of commodities consumed and household characteristics such as size of family labor force, number of non-workers (dependents) and their age, sex composition, age of household head (an indication of life cycle effect) and level of education.

Taken together, these considerations mean that the level and pattern of allocation of family labor time are function of wages, price of consumed commodities, household characteristics and conditions of production.

Of interest here is the effect of migration of a family member on output and consumption of the household. In a study in Malaysia, (Barnum and Squire (1979) has found that a migration of a working member from an agricultural household affect

per capita consumption patterns through an induced change in pattern of time allocation and through change in the extent of household participation in the labor market. When the household is participating in the labor market, the level of agricultural production, which as assumed will maximize the profit, can be determined independently of the number of working family members. The economic cost of migration in terms of production forgone is determined to a large part by the supply response of household members to changes in family composition due to migration of one (or more) member of the family. If per capita labor supply of the remaining household members remain constant, then the entire impact of migration is transmitted to the labor market through increasing the demand for hired labor. In this case, migration will lead to a loss in the output, the extent of which will be determined by the resultant change in the agricultural wage rate. On the other hand, if per capita labour supply increases proportionately with decrease in the number of the working family members, then there is no effect on the labor market and the economic cost of migration in this case is zero.

There is an obvious need to examine these issues in different socio-economic settings with or without the presence of an active labor market.

It is evident, that in agricultural sector especially in less developed countries, the basic unit of decisions (and hence of analysis) regardless of the nature of these decisions, be it economic or non-economic, is not the individual taken in isolation but as a member of a family unit. The basic decision

which is our concern here is the decision to migrate. Before examining in detail the decision making process leading to migration, we will examine first the environment within which the decision making unit lives, namely the village.

4. THE SETTING: LABOR UTILIZATION, TECHNOLOGY, THE VILLAGE SOCIO-ECONOMIC ENVIRONMENT AND MIGRATION

There is no doubt that the "village environment" (as it it will be defined later) is a major variable affecting the behavior of individuals. As Connell and Lipton (1977, p. 14) put it:

> "The village, in effect though not usually in any constitutional sense, is a decision-making unit because its socio-economic and physical assets and liabilities and their inter-personal distribution, plus a degree of isolation influence and are influenced by most decisions taken within the village."

According to the same authors, the village environment is determined largely by three types of phenomena:

1) The role of certain institutions or facilities "which are more or less public": roads, schools, health centers, nearby cities, credit co-operatives, etc.
2) Amount, quality of lands, and
3) The village socio-economic system and the constraints it places upon the distribution among persons of economic influence, social status and political power; Connell and Lipton (1977).

A simple example of the effect of village characteristics on behaviour or individual is the effect of a particular mixture of land system, size and location of a village on labor input by certain groups of the village population. For example, in a subsistance village economy, based on self-employed and not too unequal "agriculturists", there is a tendency for the total amount of work to be distributed among many people; whereas in a village with a highly skewed distribution of land,

commercialized agriculture and proximity to an urban center, women and children tend to withdraw from the work force.(6)

In a comprehensive study, Dasgupta et al (1977) utilizing cross sectional analysis of about 133 Indian village surveys has tried to explain inter-village variation in job situations by reference to variations in the type of village environment. Specifically, the authors examined the relationship between the pattern of allocation of total village labour time and various socio-economic features of village life. The villages were classified according to four criteria:

a) hired and family labor
b) agricultural and non-agricultural labor
c) high and low participation villages
d) work inside the village and work outside the village (migration).

In each case a group of variables were used for classifying the villages and a series of statistical tests were performed to test whether such classification is also consistant with other socio-economic characteristics of villages. A list of 14 key socio-economic variables were choosen to represent most important aspects of village - level agricultural; education, access to nearby towns, distribution of land, commercialization of agriculture, cropping pattern, cultural life, demography, etc. The following are the major conclusions, the detailed analysis can be found in Dasgupta et al (1977, Chapters 3 and 4):

1) There is a high level of association between the socio-economic characteristics of a village and the labor utilization characteristics.

2) In all the analyses, the most significant differences between village types were associated with variables indicating land distribution and landlessness. <u>That is, intra-rural inequality is the most important factor in explaining variation in labor utilization patterns among villages.</u>

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3) Participation is consistantly higher in "self employed" villages, but the difference between "agricultural" and non-agricultural" villages is not significant in this respect. It is found that landlessness and unequal land distribution negatively influence participation, as does the presence of a high child-women ratio (in relation to adult women and older children).

4) The larger the proportion of old women and children in the labor force, the higher is the overall participation rates and the lower the duration of work.

5) Agricultural prosperity and irrigation increases the demand for hired labor and a decrease in family labor without an increase in the overall rate of participation of the village population in the work force.

6) Migration is induced by both "village-base" factors and "urban" relation factors. Land shortage, low fertility of land, skewed distribution of land and the resulting high proportion of landless agriculturists are among the major village factors. Two major urban factors are identified, namely: commercialization of agricultural and percentage of land under main cash crop. These are followed by access to towns. Literacy is found, as expected, to be very significant factor, Dasgupta et al (1977).

In this paper, we are interested in the association between migration (level and pattern) and three groups of variables which describe level and pattern of labor use and occupational structure (self employed, agricultural labourers and non-agricultural labourers), level and type of agricultural technology and finally environment variables which can be classified to two sub-groups, the first describes level and distribution of resources within the village and the second describes the extent of village integration into a wider economic setting including the extent of perceptiveness and opportunities between

the village and those outside. These three groups of variables which are related to Labor Utilization, Technology and Environment will be referred to collectively as the "setting". Of course, these three aspects are interrelated and they affect one another although differently at different levels of development.

For example, in a village with high degree of land inequality (Environment variable or E-variable), there is a sharp class division and where numerically large landless agricultural labourers and richer landholders occupy opposite ends of the socio-economic scale. Usually, in this kind of village the richer elements (especially their women and children) withdraw from labor force and hire labourers to work their land thus increasing the demand for hired labor (L-variable). Here the inequality of landholding creates both the demand for and the supply of hired labourers (landless). Since the participation of adult males in labor force does not vary significantly from one village to another (Connell and Lipton, 1977), the overall participation rate, therefore, is largely determined by the extent of participation in the work force by the women, children and the old. Thus in a village with high inequality of land, the overall participation rate is relatively low. On the contrary, the corresponding rate in a village with relatively less inequality, would be relatively high since it is determined largely by the supply of family labor (this is true if we assume, as it is empirically evident from large number of studies, that a high degree of equality is associated with a relatively high percentage of self-employed subsistence farm families. In that case, it is easier for women to combine farm work with house work and for children and the old to participate in work).

As another example, let us examine how modernization of agriculture (T-variable) affect labor participation (L-variable).

First, as it is documented in many studies in villages

in less developing countries, modernization of agriculture and especially the so called green revolution, tend to increase the skewness of land distribution (E-variable), Todaro (1974), and the "proletarisation" of the poor peasantry with the increasing concentration of village resources in a few hands. It is also associated with a shift in the mode of production from family based subsistence farming to market-oriented hired worker based production. This process, as we said before, adversely affects the participation ofthe village population in the labor force (L-variable). On the other hand, the new varieties of seeds usually encourage a shift in the cropping pattern from low labor intensive crops to relatively high labor intensive crops, Dasgupta et al (1977). This will increase the demand for hired workers. These hired workers (although they work for longer hours) will be less in numbers than the numbers offered by the landless. This group - if they do not find work in the non-agricultural activities in the village they tend to migrate.

Modernization of agriculture (T-variable) usually is associated with increasing commercialization of agriculture which will demand an increasing integration into the outside economic network (E-variable). This in turn will lead to (and will be affected by) an increasing diversification of economic and social life in the village.(7) This may well result in in-migration from other areas (mostly agricultural labourers) either looking for the job opportunities offered by the diversity of life in the village (that is, rural-rural migration) or as an intermediate stop before moving forward to the nearby towns (step-migration).

It is instructive here to see how two villages one more developed with more diversified agricultural sector, and the other less developed with subsistence agricultural sector, differ in their "setting". Utilizing data from a large number of village studies, Dasgupta et al (1977), and using multivariate analysis, they identified two different socio-economic system corresponding to two villages; more developed and less developed. The results are summarized in the following

table which is an adapted version of Table 5.20, p. 196 in Dasgupta et al (1977).

Table 2 - SUMMARY OF THE INFORMATION ON VARIOUS VARIABLE GROUPS FOR TWO CONTRASTING VILLAGE TYPES

Variables		Village	
Name	Type	More Developed	Less Developed
Participation	L	low	high
Duration	L	high	low
Self-employed agriculture	L	low	high
Agricultural labor	L	high	low
Non-agricultural activities	L	high	low
Irrigation	T	high	low
Level of technology	T	high	low
Village population size	E_1	high	low
Proportion of nucleated families	E_1	high	low
Land scarcity	E_1	high	low
Land productivity	E_1	high	low
Indebtedness	E_1	high	low
Concentration of land and landlessness	E_1	high	low
Consumption of food and inferior Cereals as % of total expenditure	E_1	high	low
Diversification of cropping pattern	E_2	high	low
Reliance on cash crops	E_2	high	low
Commercialization of agriculture	E_2	high	low
Accessibility	E_2	high	low
Diversity of social life	E_2	high	low
Education	E_2	high	low

Notes: 1) for the definition of variables and their meanings see Dasgupta et al (1977).

2) L means "Labor utilization" variable

T means "Technology" variable

E_1 means "Environment variable that refers to the level and intra-village distribution of resources.

E_2 means "Environment" variable that refers to the extent of village integration into a wider economic setting.

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These two types of village represent two opposite ends on the socio-economic scale as it is seen from the table. The important questionnow is: "HOW THESE TWO VILLAGES DIFFER IN THEIR LEVEL AND PATTERN OF MIGRATION?"

The discussion so far in the paper together with the fact that the variables in the above table comprise most of the traditional "push-pull" variables tell us that the more developed village with its high score on both push variables (E_1's variables) and pull variables (E_2's variables) will have a high volume of out migration while the reverse is true for the less developed village.(8)

In the more developed village, "push and pull" operate together but on different social classes, Connell et al (1976) (remember that in this village there is a sharp class division). The poor and landless labourers are pushed out. The better off farmers (not usually the very largest) encourage one or more sons, often in a "chain" to be pulled out, to enjoy the higher urban-rual income differentials associated with education or to acquire the cash and/or knowledge needed to improve farm technology. The "push" migration of the poor is usually individual rather than linked at first. Often, however, ultimately moves out the whole household; is increasingly rural-rural and circular and involves mostly illiterates (this is usually the type which dominates the migration flow from the less developed villages, in addition to seasonal migration). The pull migration of the middle income groups is normally linked with the head of household able to exert social control;

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is overwhelmingly rural-urban and mostly permanent. It is important to stress again the role of intra village inequality as the most important variables underlying both push and pullfactors It is higher income due to to intra rural inequality that finances the heavy initial cost of the pull migration. Also, inequality makes rich farmers able to buy labor-replacing capital equipment thus displacing the labourers, Connell et al, (1976).

Earlier, we had referred to the need to understand the interaction between the rural (village)environment, a wider economic network and the perception of position of the migrant in that system. From this viewpoint, Zelinsky (1971) seeks to answer the question: "who migrate?" by reference to stages of integration between the village and a more urban-based network. For each stage, the pattern of migration would differ. In a relatively isolated area with little development and small (or without) a monetized economy, the migration flow may well be large but undifferentiated. With greater rural-urban integration (in a more developed village and, where social differentiation has restricted access to rural opportunities) large rural-urban income differentials will produce substantial often permanent migration from rural areas. Here the pattern is more selective. Thus, where the interdependence between town and village is well advanced, a highly differentiated migration flow can take place and is increased by maldistribution of village resources.

Although stages are seldom precisely separated, an extensive analysis of evidence from village studies has documented

such pattern of migration in which the village structure of migrants, durations and destinations change over time, Connell et al (1976).

All this present a partial view of the migration process. If push and pull factors operate together to induce migration, why some households and/or some individuals do not move at all although they experience the same conditions. To be able to answer this question, we have to approach migration from a contextual point of view. Specifically, the socio-economic determinants of migration have to be linked with household organization and strategies. This would be better grasped if they are conceptualized as components of a broader system rather than as separate factors.

Mabogunje's (1970) system approach to migration is one of the most ambitious and comprehensive theories of the social and environmental context of migration. He postulates that migration is controlled by a system of interacting elements, including rural control systems, rural adjustment mechanisms, urban control systems, urban adjustment mechanisms, positive and negative feedback channels, migration channels and finally specific stimuli to migrate. The potential migrant is a somewhat passive receiver of these stimuli. In fact, Mabogunje suggests that the "family", rather than the individual, is the rural control system "receiving" stimuli and "regulating" the migration flow.

In the following section we will examine the role of the family as the migration decision making unit.

5. THE MECHANISM: FAMILY, STRATEGY AND DECISIONS

The idea that the family is the regulator of migration flow is discussed in Connell et al (1976), Mabogunje (1970) and Urzúa (1979) among others. This view point is neatly summarized in Urzna (1979 , p. 32):

> "The choice of the family as the basic unit of analysis brings as a consequence that vis-à-vis the potential individual migrant the impacts of social, economic and cultural determinants of migration are considered to be actually filtered down to him and either weakened or strengthened by the family to which he belongs. Thus although the motivation to move is always individual, it cannot be explained solely by the socio-economic and cultural conditions prevailing in places of origin and of destination, but also by how the family organizes itself to cope with those conditions and their changes through time and by the position the individual occupies within the family."

Most indications suggest that migrants tend to come from relatively large families. In these families, it is to be expected that both need and earning capacity have expanded relative to local earning opportunities. Furthermore, with a large number of people around who can earn income, it becomes possible to diversify the portfolio of human capital in order to reduce dependence on risky income and output from farming. This point is discussed further in Connell et al (1976) and Stark (1978).

The above point suggests then that extended families are better able than nuclear ones to promote migration. The broad structure of such families allows and encourage migration. This is due to its ability to have more and wider kin contacts in town, which will facilitate migration given the importance of relatives in finding jobs and supporting migrants

when they first come to town (chain migration). In addition, such a family is more able to adjust to the migrant's absence, which is a crucial factor in the decision to migrate. It has been documented, especially in Africa, that the extent of male labor migration depends on the availability of such flexible and corporate kinship structure and, furthermore, on the wife willingness and ability to increase here responsibilities within the prevailing social norms, see Connell et al (1976) for further discussion on this and other related points.

A major determinant of who migrates is the relation of family members to the family land as expressed through the inheritance practices. Therefore, the birth order is a crucial factor in this regard. Evidences show that most migrants tend to be second, third or fourth sons, Muller (1976).

If the "birth " order of the villager affect his chance of migration, the order of other demographic events may well determine the time of his move. This in essence the life cycle approach to migrations which states that migration occurs at certain stages in the person's life. For example, young persons who enter the labor force or get married generally leave the parental home, often combining geographic movement with the change in household. According to Lee (1969) and Mitchel (1969), movement occurs at certain ages or stages when various social and economic pressure intensify. Migration is more likely to occur when individuals first enter the labor force, marry, have children, build a rural home, wish to accumulate capital for rural enterprises, etc. The life cycle theory is clearly supported with the fact that most of the migrants are in their young age, less than 35 years.

In discussing the decision making process leading to migration, two points have to be considered: who decides? and the motives for migration, Connell et al (1976). In the so-called "individual" migration, an individual makes the decision to leave for his own good. The other type of migration in which the family, and especially the head of the family, participates in the decision is called "linked" migration. This type of migration is usually "intended as necessary for or useful to relatives remaining in the village", Connell et al (1976 p. 24). Linked migration mostly occur either as a form of risk-spreading, or to build up a surplus for subsequent rural investment.(9) Evidences show that most migration is linked to some extent, being undertaken partly in the hope of helping the family from which the migrant came, while the extent of pure individual migration may be limited to villages with well-established tradition of migration.

The objective or motive behind migration is clearly inherent in the issue of who makes the decision of migration. Two general objectives have been mentioned in this regard in Connell et al (1976); maximization of household income or achieving a given target either for consumer purchases or for agricultural investment. The target migration clearly related to the probability of returning and thus it is conditional upon the stage of integration into village life together with the stage of life cycle. What ever the motives are, they are usually involve a stated economic objective and they are determined by the form in which the decision to migrate is made.

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Centered to the concept of the family as decision making unit (which is implicit in the discussion in this section and which is the basic premise underlying the working hypothesis of this paper) is "the way(s) by which the family mobilizes its available human, economic and social resources", or family strategy as defined in Urzúa (1979) p. 38), in order to achieve its objectives. The objectives differ according to the position which the family occupies in the socio-economic structure. Families belong to the lower classes, have as their main objective the maintenance of their standard of living, whereas, other families have their objective the improvement of their socio-economic position. The strategies adopted by the families to achieve their objectives are called survival and mobility strategy respectively, Urzúa (1979).

We had referred earlier to the importance of looking at the agricultural household as a farm-family combining both production and consumption decisions and the implications that follow. Furthermore, we had stressed the importance of the presence of an active labor market in determining the way by which the household adaptes to its conditions. Empirically, it has been documented again and again (Nagi (1971), Squire (1969), Repetto (1978) and Yotopoulos (1978), for example) that <u>households on the smallest holding adapt to their situation of resource scarcity by utilizing more intensively all they have.</u> Specifically, the smaller the amount of land per capita: a) the higher the labor force participation rates of women and

children who must engage in market labor to supplement household income, b) the larger the importance of casual wage earning as a fraction of total household income, and c) the larger the importance of participation in non-agricultural activities.

Another response (especially if there is not enough off-farm job opportunities) would be outside work, i.e. migration.

These type of strategies are closely related to the theory of multiphasic response formulated about 20 years ago by Davis (1963). Thus, migration would be another demographic response to changing socio-economic conditions. Other possible responses, including celibacy postment of marriage, contraceptive, etc.

It is important to realize that demographic responses are highly interrelated: if one changes, the others change also. This interdependence often makes it difficult to specify which demographic response is primary.(10) From all the demographic responses, migration, in the short run, appears to be the most efficient response. It can increase or decrease population more rapidly than can changing fertility and is more efficient because it is selective. Its selective character also indicates that population composition and distribution can be changed more rapidly through migration than through the fertility response.(11)

6. RESEARCH IMPLICATIONS

Two points emerge from the discussion in previous sections:

1) The push-pull factors (the traditional socio-economic determinants of migration) explain the "intensity" of migration from a given village, i.e. the volume of migration or the village migration rate and they can be used to account for variations among villages in that respect.

2) The "propensity" of migration for individuals (although we can know its distribution within a given population by examining the socio-economic composition of migrants) cannot be explained solely by the push-pull factors, but has to be in addition, examined in terms of differential individual responses to the stimuli both from the environment (via the push-pull factors) and from within the system (via the type of family organization and strategy and the position the individual occupies within the family).

A model aiming at analyzing the migration process along these lines, therefore requires simultaneous measurements at two levels.[12] Village socio-economic structure (the setting) namely labor utilization, technology and environment, and household strategies, preferably selecting village, of different sizes and at different levels of development. Special surveys like Farm Management Surveys and Rural Employment Surveys are particularly valuable in this regard. Explaining the variations in aggragate (village) migration rates in terms of the socio-

economic systems from which the migrants have come is identical to the so-called macro-approach to econometric migration research, Todaro (1976). Here, an aggragate migration function should be estimated for different villages at different levels of development.

In the analysis of household strategies and their adaptation to the changing socio-economic conditions, conventional socio-economic stratification measures (based on occupations and incomes of household members) should be combined with analysis of the stage in the domestic cycle and dependency level attained by the household, Musgrove (1980). Decisions regarding the level and pattern of participation of household members are of special interest. Since migration is one of the demographic phenomena which has both consumption and production overtones, and is a family, rather than an individual decision a starting point is a family (rather than individual) utility maximization approach. Ideally, a behavioral (objective) function should be specified for each class of households with a migration as an endogenous variable. Specifically then, a micro economic model of agricultural household is therefore necessary in the approach we suggest here.[13] Apart from its significance in understanding the differential behaviors of households, from a conceptual point of view, this approach, by emphasizing the importance of the position of households in the socio-economic structure of their villages as a factor in the decision making process leading to migration, is particularly useful in designing

policies for achieving desired migration goals for specific socio-economic classes.

In Section 4, we examined some of the labor utilization characteristics of two types of villages; more developed and less developed. In the first type of village, with high intra-village inequality (and thus with a high rate of migration as discussed there), high level of technology and productivity and high man/land ratios, there is a high work duration and low participation (due to withdrawal of women and children from labor force and the longer hours of work by the hired labor who replace them). In the second type of village with less inequality (and relatively low rate of migration), low productivity and low technology and low man/land ratios, there is low work duration and high participation (work is more or less distributed equally).

Migration, being highly selective by age and sex, alters the structure of food requirement and labor input in the farm family and thus represents one of the constraints on labor utilization choices at the household level. In addition, migration by moving labor from the village, it also affects its agricultural production. To improve our understanding of these issues, one way would be to analyze in detail these aspects of migration which are relevant, especially distinctions between seasonal and permanent migration; its size and age-sex occupation distribution; its allocation among family farm of different sizes, household size and composition, etc. This can be done at the first level of analysis, namely, the village level, and preferably at two different levels of development.

Another way would be to examine directly the relationship between agricultural output and labor utilization characteristics utilizing the "labor utilization identity" developed by Lipton,(Connell, Lipton (1977) According to this identity, output per person (Y/P) in a given period and area can be decomposed to be the product of output per man-day (Y/D = labor productivity) and three determinants of labor utilization: the demographic factor which is extremely influenced by migration (W/P = persons of working age as a proportion of population), the participation factor (L/W = workers as a proportion of persons of working age), and the duration factor (D/L = standard days worked for worker). A major usefulness of the identity, is that it facilitates comparative analysis between different villages and different settings, and between different classes of households according to the values given to the components in the right hand side of the identity. To understand why labor input on or off the family farm (including work outside the village, i.e. migration) reached a particular level, we need to know the household size, composition and structure (supply constraints) for different occupational income and land holding groups. This naturally should be done within a micro model of the agricultural household, i.e. at the second level of analysis.

It is important to stress here again the importance of household participation in the labor market in examining the effect of migration on output at the household level. In a study done in Malaysia and using a micro-economic model of agricultural household Barnum and Squire (1979)[14] have found

that the ultimate effect on output due to migration depends on the response of hired labor and the household to change in the market wage, the major factor being how the household reacts to the migration of one (or more) of its members; by increasing per capita labor supply (or working longer hours) or by increasing the quantity of hired labor. The mediation of all these factors by village environment (especially land distribution) can be examined by formulating the micro model in two different socio-economic settings and then analysing the difference.

In addition to the theorectical significance of the distinction between less developed and more developed villages when analysing migration,[15] this distinction helps to draw attention to some forms of rural population movements which are usually understated by the current studies, and which dominate the migration flows from the less developed villages, namely: rural-rural migration and migration of total households. Although the scale of rural-rural migration is substantial and is likely to grow with the impact of labor displacement technology and worsening urban unemployments, Connell et al (1976) many studies of migration have failed to collect data on it. This may be due to inadequacy of the sampling frame, deliberately (because of excessive occupation with rural-urban migration) or because of special characteristics of rural-rural migration, e.g., disperse destinations, short periods of stay (due to the fact that large part of rural-rural migration is seasonal), etc. Apart of its importance perse, careful study of rural-rural migration can provide information useful in designing

public policies aiming at replacing potentially unsuccessful rural-urban migration by successful rural-rural flows. Among these policies are rural labor exchanges, transport to and from areas of seasonal labor shortage, and acceptable temporary homes near those areas, Bose (1978).

Household migration is seldom recorded in most of village studies due to their "one-stop" nature. These studies therefore systematically underestimate out-migration rates - and probably also the share of agricultural labourers among migrants since they dominate household rather than individual migration.

This will result in return in over representation of the more prosperous villagers in migration totals since it is richer families that tend to send out their members into individual migration. A careful design of the survey and/or a longitudinal survey may be needed to improve the coverage of this type of migration.

The approach we suggest here with its emphasis on analysing migration at two levels, macro (village) and micro (household) compels us to advance a word of caution. This has to do with trying to use the association established between two variables at one level of analysis to infer association between the two variables at another level of analysis (without other evidence). This is known as "ecological fallacy", Robinson (1950) and Connell et al (1976). For example, the association between the percentage of landless households and the percentage of out migrating households in a village (reported in large number

of studies) does not preclude the possibility that the rich households may send more migrants than the poor ones. This point has been discussed elsewhere in this paper.

If it is wrong to apply conclusions drawn at one level of aggregation to another level of aggregation, it is also wrong to assume that the nature of relationship that exists between two variables (namely; the order of causation) at one point of time (as it is established from one-shot study) has been the same over a long period of time. This is known as the "simultaneity bias" problem and it is important to discuss it here because of its implication for interpreting the results of migration studies.

Most of migration studies are one-shot studies, and hence are time-specific, therefore they do not account for changes in the relationship between migration and other variables over time. When a certain village has a strong tradition of migration, its present demographic and environmental situation (i.e., at the time of the survey) would be the result of the interaction between migration and other variables in the past. For this village, the association between migration and present environment is difficult to interpret, since the original conditions in village life which encouraged the first wave of out-migration may have changed by the time of the survey. Thus, it would be difficult to separate cause from effect in this kind of studies. For example, if poverty leads to migration and migration leads to improvement in the level of living

through remittances, for example, studies made early in the migration history of the village will suggest a link between poverty and migration, but studies made at later stages will suggest a link between wealth and migration.

A research strategy therefore, would be to perform longitudinal studies of different types of villages (ie, at different level of development and hence with varying levels and patterns of migration) in order to assess the changing pattern of relationship between variables. In addition, the single equation approach has to be replaced by a simultaneous equation approach.

FOOTNOTES

(1) For a recent review of the state of the art, see the surveys and bibliographies of Greenwood (1975), Todaro (1976) and Yap (1977).

(2) An extensive analysis of the evidence on migration available from numerous village studies, Connell et al (1976) has documented that the most important single variable that induces migration is the intra-village distribution of land; the main source of agricultural income-earning opportunities. Thus the reduction of intra-rural inequality, may be a better cure for urban unemployment than is the expansion of urban economic activities as Todaro's work suggests. For more discussion of Todaro's work see Connell et al (1976).

(3) At the same time, population pressure induces a more intensive farming system. Boserup (1965) discusses in detail how in preindustrial societies population pressure has been accompanied by a more intensive use of the land and this intensification consists of shortening or even elimination of recovery periods between two crops on any given piece of land.

(4) It is important to note here that the popular "push-pull" distinction is analytically unsatisfactory even if it is brought about by the importance of rural inequality in migration as mentioned earlier. Migrants "pushed" out of the village are attracted to more satisfactory earning opportunities outside, where migrants "pulled" to a city job are induced "out" by the failure of the rural area to provide adequate income or job. What is needed therefore

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is an analysis of the migration process at two different levels: the village level (its environment which includes the rural socio-economic determinants of migration) and the family level (with the individual prospective migrant(s) taken as a member of it) because it is "the" decision making unit that concerns us here. This will be examined in detail toward the end of the paper.

(5) For a discussion of this point, see Barnum and Squire (1979) and Squire (1979). The following discussion draws heavily on Barnum and Squire (1979).

(6) See the discussion in Section 2.

(7) Admittedly, this is both an over simplified and partial account of the interaction between outside factors and modernization of a village, however, it is sufficient for our purpose.

(8) In addition the more developed village with its relatively developed social and economic life is also a probable destination for rural-rural migrants as it has been mentioned earlier.

(9) Stark (1978) gives an extension and comprehensive analysis of the migration process, using specifically this motive as his point of departure.

(10) We will not discuss here the interrelation between migration and fertility, the interested reader may refer to Caldwell (1976) and Muller (1976).

(11) A completely contrasting view is to conceptualize migration as a demographic phenomenon, with an occurance rate governed by the age and sex characteristics of the population. Among others, Sloboda and Carroll (1974; cited in

Findley (1977)) Suggest that age-specific migration rates can be expressed in the same manner as mortality and fertility rates. Castro and Rogers (1979) go step further by trying to construct model migration schedules as it has been the case with mortality and fertility.

(12) The rate and the propensity to migrate, however, are not independent. The nature of any system will, in part, determine which individuals are encouraged to migrate. A simple example is the inheritance practices that work against the possession of land by young males who constitute a major component of most migration flows.

(13) The distinction between subsistence or utility maximizing households and large or profit-maximizing farm may not be substantiated empirically, if large majority of agricultural households regardless of farm size participate in the labor market either or buyers or sellers. In this case, labor market participation should be important component of models of agricultural households Squire (1979).

(14) In this work, however, migration was assumed exogenous to the model.

(15) The socio-economic environment in the more developed villages is often such as to make both in-migration and out-migration likely. Recall that such a village (cf. Table 1) has high level of resource inequality which tend to push out the poor and pull out the rich in search for better opportunities. In addition, such a village with its diverse social life and with the availability of non-agricultural employment attract migrants, from other rural areas. To ignore this possibility of in-migration in such villages and to lump them together with other villages which induce only out-migration (the less developed village) could well distort the relation between migration and village characteristics.

REFERENCES

Adams, D.W. (1969). "Rural migration and agricultural development in Colombia", Economic Development and Cultural change, Vol. (17), pp. 527-539.

Addo, N.O. (1975). "Internal migration differentials and their effects on socio demographic change", in Caldwell, J.C. (ed), Population Growth and Socio-Economic Change in West Africa. Colombia University Press, N.Y., pp. 282-407.

Barnum, H.W. and L. Squire (1979). A Model of an Agricultural Household: Theory and Evidence, World Bank Staff occasional papers, No. 27, Johns Hopkins Univ. Press.

Bhattacharjee, J.P. (1974). "On Balance", in Poleman, T. and D. Freebairn (eds), Food, Population and Employment: The Impact of the Green Revolution. Praeger, N.Y., pp. 245-268.

Bose, A. (1978). India's Urbanization 1901-2001, 2nd edition Tata - McGraw Hill, New Delhi.

Boserup, E. (1965). The Conditions of Agricultural Growth: The Economics of Agrarian Change Under Population Pressure, Aldine, Chicago, USA.

Caldwell, J.C. (1976). "Towards a restatement of demographic transition theory", Population and Development Review, Vol. (2), pp. 321-366.

Castro, L and A. Rogers (1979). Model Migration Schedules, Working Paper, International Institute for Applied System Analysis, Austrin.

Connell, J., B. Dasgupta, R. Laishley and M. Lipton (1976). Migration from Rural Areas: The Evidence from Village Studies, Oxford Univ., Press, Delhi.

Dasgupta, B., R. Laishley, H. Lucas and B. Mitchell (1977). Village Society and Labor Use. Oxford Univ. Press, Delhi.

Davis, K. (1963). "The theory of change and response in modern demographic history". Population Index, Vol. (29), No. 4.

Findley, S. (1977). Planning for Internal Migration: A Review of Issues and Policies in Developing Countries, US Bureau of the census, Government Printing Office, Washington, D.C.

Goldman, R. and L. Squire (1978). "Technical change, labor use and income distribution in the Muda irrigation project", Development discussion paper No. 35, Harvard Institute for International Development.

Gosal, G.S. and G. Krishan (1975). "Patterns of internal migration in India", in Kosinski, L.A. and R.M. Prothers (eds), People on the Move: Studies in Internal Migration, Methnen, London, pp. 193-206

Greenwood, M.J. (1975). "Research on internal migration in the United States: a Survey". Journal of Economic Literature, 13, pp. 297-433

Hansen, B. (1969). "Employment and wages in rural Egypt", American Economic Review, pp. 298-313, 58

Harris, J.R. and Todaro, M.P. (1971). "Migration, unemployment and development: a two-sector analysis", American Economic Review 60, pp. 128-142.

Kaneda, H. (1979). Issues in policy analysis of agricultural development and internal migration, Working Paper 79-109, International Institute for Applied System Analysis, Austria.

Ladejinsky, W. (1970). "Ironies of India's Green Revolution", Foreign Affairs

Lee, E. (1966). "A theory of migration", Demography, 3, pp. 47-57, Reprinted in J. Jackson (ed) 1969, Migration, Cambridge Univ. Press, pp. 282-297.

Mabogunje, A.L. (1970). "System approach to a theory of rural-urban migration". Geographical Analysis, Vol. (2), pp 1-18.

Mitchell, J.C. (1969). "Structural plurality, urbanization, and and labor circulation in Southern Rhodesia", in J. Jackson (ed.) Migration, Cambridge Univ. Press, Cambridge.

Musgrove, P. (1980) "Household size and composition, employment and poverty in urban Latin America", Economic Development and Cultural Change, Vol. (28), pp. 249-266.

Muller, E. (1975). "The impact of agricultural change on demographic development in the third world", in Population Growth and Economic Development in the Third World, IUSSP, Belgium.

Myrdal, G. (1968). Asian Drama, Allen lane, Vol (2), London

Nagi, M.H. (1971). Labor Force and Employment in Egypt: A A Demographic and Socio-Economic Analysis, Prager, New York.

Pryor, R.J. (1975). "Migration and the process of modernization", in Kosinski, L. and R.M. Prothero (eds). People on the Move, Studies in International Migration London.

Ravenstein, E. (1885). "The laws of migration I". Journal of the Royal Statistical Society, 48, pp. 167-227

Ravenstein, E. (1889). "The laws of Migration II" Journal of the Royal Statistical Society, 52, pp.241-301

Robinson, W.S. (1950). "Ecological Correlation and the behavior of individuals", American Sociological Review.

Rogers, A. (1977). Migration, Urbanization, Resources and Development, International Institute for Applied System Analysis, RR . 77-14, Austria.

Sjaastad, L.A. (1962). "The costs and returns to human migration", J. Political Economy 70, pp. 80-93.

Sloboda, J.E. and T.W. Carroll (1974). Approaches to Modelling Off-Farm Migration, Korean Agricultural Sector Simulation Project, WP 74-5, Michigan State Univ., East Lansing.

Squire, L. (1979). Labor Force, Employment and Labor Markets in the Course of Economic Development, World Bank Staff working paper No. 336, World Bank.

Stark, O. (1978). Economic-Demographic Interactions in Agricultural Development: The Case of Rural to Urban Migration, FAO, ES:DP/INT/73/P02, Technical Paper 6.

Todaro, M. (1974). "Industrialization and Unemployment in Developing Nations", In Poleman, T. and D. Freebairn (eds), Food, Population and Employment: The Impact of Green Revolution, Praeger, N.Y., pp.152-166.

Todaro, M. (1976). Internal Migration in Developing Countries, ILO, Geneva.

Urzua, R. (1979). "Population Redistribution Mechanisms as related to various forms of development", Paper presented at UN/UNFPA workshop on Population Distribution Policies in Development Planning, Bangkok.

Willekens, F. (1977). Spatial Population Growth in Developing Countries: With a Special Emphasis on the Impact of Agriculture. International Institute for Applied System Analysis, WP-77-4, Austria.

Yap,L. (1977). "The attraction of cities: a review of the migration literature". J. of Development Economics, pp. 239-264.

Yotopoulos, P. (1978). The Population Problem and the Development Solution, FAO, ES:DP/INT/73/P02, Technical Paper 2.

Zelinsky, W. (1971). "The hypothesis of the mobility transition", Geographical Review 41, pp. 219-49.