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PN-AAx-010
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MIGRATION AND FERTILITY:
EMPIRICAL FINDINGS, THEORETICAL
RELATIONSHIPS AND POLICY IMPLICATIONS

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By

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Prepared under Contract No. AID/OTR-147-79-96 for PPC/PDPR
of the Agency for International Development, April 1980.

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Acknowledgements

The authors gratefully acknowledge support from The Agency for International Development, PPC/PDPR for the preparation of this report. We would like to thank Warren C. Robinson and Shannon Stokes for helpful criticisms of an earlier draft, and Thomas Burch for permission to cite an unpublished manuscript.

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THEORETICAL RELATIONSHIPS, AND POLICY-IMPLICATIONS

PART I

Introduction

As the volume of migration from rural to urban areas continues to increase, and as relatively high levels of rural fertility are better documented the question of the nature of the relationship between migration and fertility becomes more pressing. There is a growing interest on the part of development planners, government officials, and academicians in the processes and mechanisms by which migration has an impact on both regional fertility rates and individual fertility levels. Two concerns repeatedly voiced are the generally high population growth rates and the high rates of metropolitan growth resulting from urban migration.

As an indication of the magnitude of the problem, Keeley (1976) estimates that "governments representing 81 percent of the population of the developing world have declared their overall population growth rates to be too high" (p.111) and Findley (1977) states that 50 percent of the less developed countries consider the growth of their metropolitan areas to be excessive. In response to these concerns, programs aimed at fertility reduction and at redirection of urban migration flows are frequently included in development programs. For example, approximately one half of the less developed countries which consider their urban growth excessive have developed programs and policies attempting to redirect urban migration (Findley, 1977).

Even a very superficial examination of the social and economic problems of many of the cities in the developing world reveals the basis for concern about migration and fertility. As Todaro (1976) points out, "migration today is being increasingly looked upon as the major contributing factor to the ubiquitous phenomenon of urban surplus labor and as a force which continues to exacerbate already serious urban unemployment problems caused by growing economic and structural imbalances between urban and rural areas" (p.2).

The situation becomes even more critical when the fertility of migrants is considered as well. Since rural-urban migrants typically bear a larger number of children than natives in the urban areas in a sense they contribute twice to the problem of urban growth. High fertility in the rural areas further intensifies the problem in that it tends to be a factor contributing to population pressure and relative scarcity of land and resources in the region of origin (Awad, 1970). The problem is a two sided one: The decision to migrate is related to the high fertility rates in the rural areas; and the high rates of urban growth are related to the inflow of rural migrants who typically bring their high fertility rates with them.

The description of this general pattern, however, should not obscure the important variability in characteristics of migrants (including their fertility patterns), the characteristics of rural regions of origin, and the characteristics of the urban destination. This variability will inevitably have an impact on the way in which the migration process affects fertility. Four likely sources of the variability in the impact of migration on fertility are:

- (1) The magnitude of the difference between the population of origin and the population of destination in social economic, demographic, and cultural characteristics;
- (2) The relative duration of exposure to the population of origin as opposed to the population of destination;
- (3) The characteristics of migrants which tend to insulate them from the influence of the new environment; or conversely, the characteristics of migrants which tend to involve or expose them to the influence of the new environment; and
- (4) The characteristics of migrants which constrain their potential response to the environmental changes resulting from migration.

All these factors will influence the fertility response of migrants to their new environment and must be taken into account by planners who wish to predict or anticipate changes in both individual and aggregate fertility levels or wish to reduce fertility or migration rates.

The volume of literature which deals with migration or the relationship between migration and fertility is enormous. The vast array and diversity of work in this area during the last several decades has motivated a number of extremely useful general reviews of studies dealing with migration (Connell et al., 1976; Ritchey, 1976; Shaw, 1975; Yap, 1975; Graves and Graves, 1974; among others). Two recent reviews by Findley (1977;1978) of studies of migration and fertility provide an excellent summary and critical evaluation of research in this area. The availability of these studies obviates the need for yet another

general review. For reference purposes three appendices are included which summarize many of the empirical studies of the last several decades. What may be useful here, however, is a slightly different approach to the literature. We will attempt to develop a comprehensive decision-making framework which incorporates the determinants of both fertility decisions and migration decisions.

Purposes and Objectives of Review

The aim of this review is to provide a theoretical decision-making framework and an empirical knowledge base about the relationship between migration and fertility necessary for more effective planning and development strategy by:

- (1) Evaluating what is known from the literature about the relationship between migration fertility for both individual and aggregate levels;
- (2) Specifying the theoretical relationships among socio-economic characteristics which are involved in both fertility and migration decisions emphasizing similarities in the decision-making process, and
- (3) Based on the theoretical relationships specified in (2) above, evaluating possible consequences of policy alternatives aimed at fertility reduction and redirection of migration flows.

The analysis of these decision making processes is a crucial first step on the way to successful policy intervention. As Todaro has suggested, "unless we can begin to quantify the relative impact of different economic policies on the nature, character and magnitude of migration, and to

ascertain what factors influence a person's decision to move in different countries and regions, we shall be unable to formulate policies to deal effectively with the dual problems of rapid urban population growth and rising urban marginalism" (Todaro, 1976:5).

PART II

A Theoretical Fertility for Fertility and Migration Decisions

In this section we review several microeconomic approaches to migration and fertility. Points of congruence among the various theories are discussed as the basis for a household maximization framework. This framework is presented in Figure 1, and is used to structure the review of empirical research which follows in Part III.

A. Microeconomic Theories of Fertility

In attempting to develop a framework relevant to both fertility and migration decisions, it is useful to examine the major economic models for each, and to compare and contrast them. Much of the ground-breaking work in fertility research during the past several decades falls under the heading of the new household economics (Becker, 1960, 1965; Schultz, 1969a). The emphasis on household is critical here; it is the unit within which resources are allocated, alternatives are evaluated, and decisions are made. "Using as a framework the microeconomic model of the consumer's decision-making process in allocating a restricted budget among alternative uses, the 'new household economists' have extended this model by introducing a time constraint. In this case the household must choose not only among goods and services available in the market place, but also among all activities that consume time, such as raising children" (IUSSP, 1977:5). Children are viewed in this framework as investment goods providing pleasure and enjoyment. Although many of the studies designed to investigate the implications of this model have used U.S. data, there is a growing body of research from Third

World countries as well. A major focus of this research has been "to determine the extent to which economic variables, such as income, prices, and wages can account for the fertility behavior of households" (IUSSP, 1977:5).

Recently, efforts have been made to broaden the narrowly economic approach to include such factors as tastes and preferences, cultural norms, supply factors as well as demand factors (Easterlin, 1975), peer approval, etc. Robinson and Harbison (1980) have summarized recent work on fertility theory and differences among the assumptions involved in various approaches. The framework which they propose retains the implicit socio-cultural determinants of tastes and preferences, socio-cultural determinants of actual and perceived costs, and biological constraints mediating between the fertility decision and the fertility outcome. They assume that fertility decisions are rational, representing an attempt to maximize perceived utility. The framework therefore includes determinants of the perception or expectation of utility, as well as actual benefits.

B. Micro-Economic Theories of Migration

Just as there has been a recent development in fertility research of microeconomic models, migration is increasingly being viewed as a microeconomic process. Migration is seen by many to be an investment in "human capital" (Sjaastad, 1962). An individual will migrate if, in his own private estimation, he thinks he will be better off by doing so (DaVanzo, 1979). A recent version of this approach, developed by Todaro (1976), "starts from the assumption that migration is based primarily on rational economic calculations of the individual migrant. Despite the persistence of high urban unemployment, migration proceeds in response

to urban-rural differences in expected rather than actual income. The fundamental premise is that migrants as decision-makers consider the various labor market opportunities available to them as between, say, the rural and the urban sectors and choose the one which maximizes their expected gains from migration." (Todaro, 1976:28-29).

A recent volume edited by De Jong and Gardner (In Press) includes a variety of micro-level approaches to migration decision-making. Although economic factors received major attention, the impact of other factors such as cultural values, preferences, family and kinship ties, and regional characteristics on decision-making is evaluated as well.

C. Micro-Level Approaches to Demographic Behavior

The microeconomic models of migration and fertility will be discussed in depth later in the paper, and empirical support for them reviewed. Here, we focus on the theoretical similarities between the two approaches and more generally on the underlying similarity of decision-making with respect to all demographic behavior. In an extremely insightful article Burca (1980), after summarizing theoretical approaches to several types of demographic behavior (migration, fertility, divorce), suggests that "all of these theories are strikingly similar at their core" (p.23).

He points out that all of the theories which he reviews, and this is especially true of the theories of migration and fertility which we have mentioned here, are micro-level theories of decision-making. The unit of analysis is an individual or a household, within which alternatives are evaluated and rational decisions made. Secondly, all of the theories cited assume that the decision-maker is attempting to maximize utility, and that the "motivation to act derives from an implicit or explicit

comparison of two states." Burch looks at some specific dissimilarities among the models, but concludes by asking "why have theories of migration, theories of fertility, theories of moving, theories of divorce when one theory of demographic behavior might serve for all?" (p.23). We concur, and suggest that such an approach is absolutely essential for understanding of the interdependent demographic decisions of migration and fertility, and for successful policy intervention.

D. Household Decision-Making Models

Both migration and fertility are the outcome of a decision-making process which involves the comparative evaluation of two or more alternatives. It is useful here to specify in somewhat more detail the motivational components of the decision-making process. Sell and De Jong have adapted the theory of decision making developed by Atkinson (1964) to migration issues. They review the four components of motivational theory:

Rational changes in instrumental behavior are conceived as the interactive results of four analytical components representing personal dispositions, environmental factors, and person-environment interactions. The four components are: (1) availability, (2) motive, (3) expectancy, and (4) incentive. The concept of availability represents whether or not the change in behavior under analysis is cognitively and/or physically possible. Motive refers to the personal and/or situational strength of the goal toward which the decision process is directed. Expectancy refers to the decision-maker's subjective evaluation of goal attainment. Incentives represent an array of goal-associated factors which variously encourage or discourage the change in behavior under consideration. (Sell and De Jong, 1978:322)

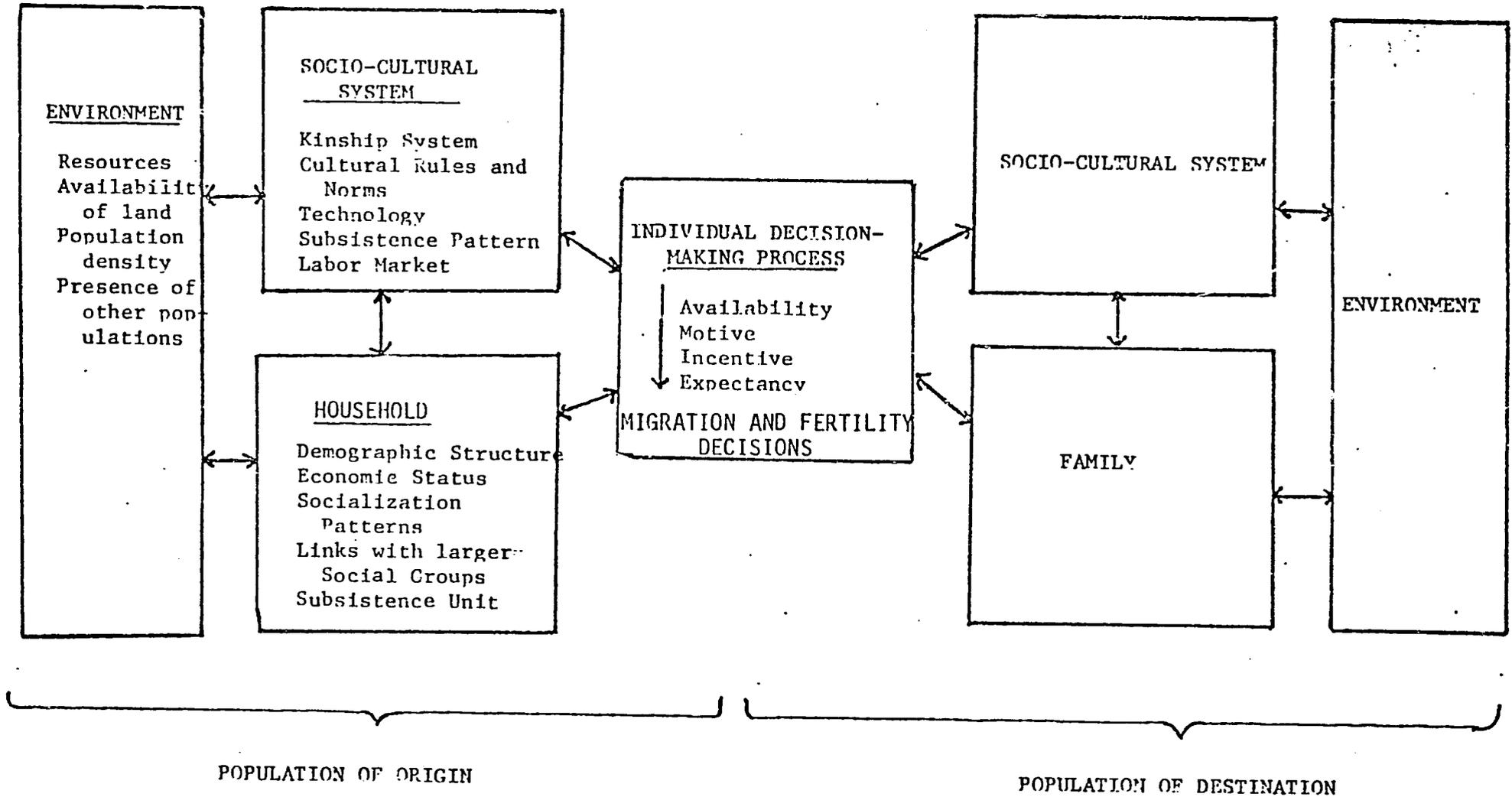
These motivational variables are the migration analog of the Davis and Blake (1950) intermediate variables relating to fertility. Excepting forced migration (slave trade, exile, etc.), aspects of the social, economic, or familial structure do not "cause" migration; they cause a

shift in the evaluation of availability, expectancy, incentive, or motive by the individual who then reevaluates his options and decides whether or not to migrate. An individual does not, however, evaluate options and balance motivational components in a vacuum. The process occurs within a particular household, a particular socio-cultural setting, and a particular physical environment. It is important in focusing on the decision-making process not to lose track of the structural context. Graves and Graves (1974:117) suggest a balance of structural and individual decision-making factors in analyzing the migration process: "Operating within the many constraints which his physical and social environments impose, the migrant seeks to overcome the problems confronting him by choosing among perceived available options."

Figure 1 represents the systematic way in which the components of the individual decision-making process are affected by links with the family, the socio-cultural system, and the environment. The most immediate context for the individual is the family or household. The household is the link between the individual and the larger socio-cultural system. An individual's place in society, as defined by the kinship system, cultural rules and norms, and social roles is specified by his position within a particular household.

The household, in its functions as subsistence unit, socializing unit, and social network will inevitably have a major impact on motivational aspects of fertility and migration decisions. As the subsistence unit, the household assigns different roles in the family labor force to its members, determines differential access to family resources on the basis of kinship, age, title, etc., attempts to exploit all avail-

Figure 1: A Household Decision-Making Framework



able resources (which sometimes includes an external labor market), and determines rules for passing on family holdings. The role assigned to an individual in fulfilling all these functions will inevitably be important in determining both the motivation to have children and the motivation to migrate.

As the unit which socializes its members, the family or household inculcates attitudes, values, and feelings of responsibility. As a child grows up, these values, as well as both positive and negative feelings toward family members will influence the decision-making process in general, and more specifically fertility and migration decisions. To the extent to which societies at different levels of development, or from different geographical regions of the world differ in both household structure and socialization patterns, differences may be expected in the relative importance of the four motivational components of decision-making.

Just as the family within which an individual grows up functions as a social group, providing affective ties and predictable relationships, the potential migrant may anticipate that a similar function will be served by family members who have already migrated. Numerous studies have shown that family members in the new environment serve an important social group function for newly arrived relatives (Dutoit, 1975; Axelrod, 1956; Bell and Boat, 1957; Blumberg and Bell, 1959; Choldin, 1973; and Litwak, 1958). Although Blumberg and Bell (1959) and Bell and Boat (1957) find that ties of this sort may be relatively more important for migrants from lower income groups, still in most cases the availability of the migration option, as well as expectation of success is increased by the presence of family members in the new environment.

Figure 1 emphasizes the pivotal nature of the household in decision-making behavior. This framework highlights the fact that in order to analyze the migration decision as well as the future fertility decisions of migrants, at least two kinds of information are necessary: (1) Some indication of the status of the migrant in the original population and his potential place in the new environment; and (2) Some measure of the migrant's perception of alternatives, with respect to both fertility and migration, and his relative valuation of them. Therefore, the framework incorporates both structural and motivational (or psychological) factors as inputs to decision-making.

Several brief examples may serve as an introduction to this kind of analysis. Keeley (1976) points out that "even if a government has no explicit population policy, and no desire to alter demographic variables, many social and economic policies do have important demographic impacts. For example, changes in education, income distribution, demand for female labor, or infant mortality can have significant impacts on fertility" (p.111). In the context of Figure 1 it is clear that an increase in female education, for example, would very likely alter motivational components of both fertility and migration decision-making.

From a different perspective, McNulty (1976), in examining patterns of West African urbanization, proposes that the indigenous cultural system, combined with the impact of colonialism, has played a major role in shaping migration streams and the development of cities. Relating this interpretation to Figure 1 it is clear that the political environment and socio-cultural system within which an individual exists will shape household formation, ties with other communities and evaluation of options. In the

West African case, McNulty suggests that the period of colonialism resulted in growth of cities that were structurally unsound, lacking infrastructure and an economic base other than export. The ability of these cities to absorb surplus labor from the rural areas is minimal.

These two brief examples highlight the interrelationships among the socio-cultural system. The family or household, and individual decision-making which are schematically represented in Figure 1. This framework is used in the following section and structure review of the large volume of empirical studies dealing with migration and fertility.

PART III

Migration and Fertility: Major Empirical
Findings and InconsistenciesA. Introduction

In this section we will summarize the major empirical findings of the last several decades relating to migration and fertility. Our main concern here is not theoretical, but rather to develop a general picture of what relationships have been described. However, a framework is necessary to sort out the large volume of studies and present them systematically. For this purpose we will refer once again to Figure 1. This framework emphasizes the combined impact of two different environments on migration and fertility, the rural and the urban environment (or more generally, the place of origin and the place of destination). Four sets of characteristics must be considered: (1) rural regional characteristics; (2) rural individual characteristics; (3) urban regional characteristics; and (4) urban individual characteristics.

In the process of migration, both selection and adaptation may occur. Selection refers to non-random sampling of individuals from the population at large who become part of the migration stream. Migrants typically differ systematically from the general population in such characteristics as age and education. Selection is one of several possible explanations for characteristics of migrants observed at their destination, suggesting that these characteristics are not the result of adjustment to the new environment, but rather were brought from the original environment. Adaptation, on the other hand, is the process by which the characteristics of migrants are gradually modified in the new environment.

The characteristics of individuals who selectively make the migration decision are related to the extent of adaptation or adjustment possible. Regional characteristics at the origin, combined with individual characteristics, determine the motivation to migrate. Once this decision has been made, it is the characteristics of the urban region, in interaction with characteristics of the individual migrants which determine the fertility response.

B. Rural and Urban Regional Characteristics:
Inputs to the Migration Decision

Studies which attempt to evaluate the impact of migration on fertility must first of all have a measure of the general level of fertility in the population of origin and destination, as well as various other socio-economic contrasts. Assuming that our primary concern is with rural-urban migration, the relevant literature suggests that fertility levels tend to be higher in the place of origin (the rural areas) than the destination (Miro and Mertens, 1968; Goldstein, 1973; Macisco, Bouvier, and Weller, 1970; Caldwell, 1969; among others). Reasons suggested for this pattern are numerous, including rural-urban differences in female labor force participation (Schnaiberg, 1970; Goldstein et al., 1972), differences in the relative value and costs associated with children (DaVanzo, 1972; Goldstein, 1971), differential access to family planning knowledge and facilities, different values and differences in education (Miro and Mertens, 1968). These general characteristics of rural as opposed to urban areas form the socio-cultural context within which household decisions are made.

Other more specific regional characteristics which affect one or more of the components of motivation are systems of land tenure and inheritance, man/land ratios, and levels of mechanization of agriculture. All of these, by increasing incentive, increase the probability that the decision to migrate will be made. On the regional or aggregate level, high fertility can be seen as one of the causes of migration. High fertility, combined with reductions in mortality resulting from improved health care and knowledge, have led to very rapid population growth rates in many rural areas. This growth has resulted in population pressure on resources, surplus labor, and outmigration.

By far the most important urban characteristic relevant to migration is the wage rate. The greater availability of wage labor jobs in the urban areas combined with the rural-urban wage differential attracts many migrants to the cities. Knight (1972) puts the case very strongly, stating that as long as the urban wage rate exceeds the rural supply price of labor, migration will continue.

C. Characteristics of Migrants

The preceding section reviewed how rural and urban environments differ with respect to their potential impact on fertility. This section will examine how migrants come to differ from the population at large in both of these environments. Holmes (1976) has discussed adaptation and selection as ways of conceptualizing the source of these differences. He defines selection as "the process whereby persons with a built in propensity toward lower fertility, or with characteristics normally associated with lower fertility are self-selected from the rural population and are

therefore disproportionately represented among the migrants," and adaptation as "the process by which migrants acquire urban characteristics." (Holmes, 1976:191). While it may be difficult analytically to separate these two components in the explanation of migrant fertility levels, the distinction is critical to understanding the impact of migration on aggregate and individual rates.

As Holmes points out, if selection is predominating, people with a particular fertility pattern are moving from one region to another, with the effect of widening the rural-urban fertility gap, but not affecting national rates. On the other hand, if adaptation is occurring, individuals are adopting the lower fertility patterns of the urban area, leading to a reduction in aggregate rates on the national level.

As stated previously, migration is the outcome of a decision-making process usually made in the context of the household. The structure of the household is determined by the reproductive history of the individual or couple, as well as the cultural rules relating to kinship and marriage, residence, etc. In this section we will examine structural and individual characteristics which have an impact on one or more of the four components of motivation-availability, expectancy, motive, and incentive. In terms of the framework presented in Figure 1, aspects of the environment, the socio-cultural and economic system, and the household can all have an impact on the motivational components of fertility and migration. Equally important, however, are characteristics of the migrant himself which determine his response to these contextual factors. We review here findings relating to the impact of demographic, socio-cultural, educational, and economic characteristics on the propensity to migrate, and evaluate the likely effect of these characteristics on the motivational components of decision-making.

(1) Demographic Characteristics of Migrants

Perhaps the most significant finding reported in the literature is that people with fewer children are more likely to migrate (Macisco, 1975). For example, DaVanzo and Goldstein (1979) found that "for women of approximately the same age, the migration rate is inverely related to the number of children they had given birth to as of 1971," for a sample of 1200 Maylasian households surveyed in 1976-1977.

Another way of stating the importance of this finding is to say that migrants are selected for low fertility characteristics. Goldstein (1971) found that migrants had fertility patterns that were lower than levels reported for the origin or destination. Elizaga (1966), in a survey of 10,000 individuals in Greater Santiago makes a similar suggestion on the basis of the fact that migrants had somewhat fewer sons than natives.

Macisco (1975) as well, in a study of migrants to metropolitan Lima, proposed that individuals with fewer children are more likely to decide to migrate. Hendershot (1971) also suggested that migration selects women with low fertility characteristics, since migrants had lower fertility, on the average, than the general nonmigrant population of Manila. These findings are not surprising if we consider the impact of a relatively few number of children on the decision to migrate. Simply in terms of cost, the smaller the family, the less the transportation and moving cost and the greater the availability of the migration option.

Parity or birth order may play an important role if an individual is still living in his parental family. Wyon and Gordon (1971) note that in the village which they studied in the Punjab, older sons were

kept out of school, in apprenticeship for taking over the family holdings, while younger sons were encouraged to stay in school as preparation for migration. This study provides an excellent example of a case where there is differential incentive to migrate by birth order, and this difference is reinforced by differential upbringing and training. More specifically, the incentive to migrate for a younger son resulting from lack of access to family land, combined with the increased availability of the migration option and the expectation of returns greatly increases the probability that the decision will be made.

Secondly, age is a critical variable in determining the propensity to migrate. Conneil et al. (1976:39) point out that "almost everywhere, migration concentrates extremely heavily on individuals aged 15-30." This generalization is confirmed by numerous other studies (Gugler, 1968 (in Africa); Schultz, 1971 (in Colombia)). It seems likely that age is an indicator of the extent of ties to the home community, and that the more ties and obligations an individual has, the less "cognitively available" as well as financially available the migration option will seem.

In more developed societies as well, family structure and demographic variables can work in similar ways to create ties that inhibit migration. Long (1972:371) for example, examines in detail the impact of number and ages of children on residential mobility. Using data from the Current Population Survey of the Bureau of the Census drawn monthly from 50,000 households in the U.S. he found that "married couples without children are more geographically mobile than those with children. Among those with children the age of the children exercises a mobility differential." Those couples with children less than six years old were

the most mobile. It is clearly the case that the structure and composition of the family (looking again at Figure 2) influences the type and strength of the linkages between the family and the larger society. The presence of children in the household, in and of itself, creates additional ties to community and if these children are of school age, the ties are even stronger.

Graves and Graves (1974:124) make the obvious but very important point that migrants are "drawn from those least tied" to the community. Family structure and strategy are important in specifying what it means to be least-tied. Young, single males and young couples tend to be relatively less tied to their community, not having established a family of their own or worked in a particular job for a long time. Hence, Bradfield (1963) finds that younger males, not yet having entered the labor force, are more apt to migrate from the Peruvian village of Hualyas. Additionally, he finds that the younger of two brothers is less tied because of lack of access to land.

Speare (1970:449) considers home ownership and life-cycle stage as possible determinants of residential mobility in the U.S. In findings consistent with the previous discussion he reports that mobility goes down with increasing age and duration of residence. Miller (1976:323) as well reports that the "propensity to migrate declines with successive stages of the nuclear family life cycle." He also finds support for the hypothesis that "the propensity to migrate is inversely related to extended family orientations of the wife and husband when both have relatives in the same community."

(2) Social Structural Impacts on the Decision to Migrate

In addition to demographic structure, aspects of the social structure of the family may influence the availability, expectancy, motive, and incentive of the migration option. Connell (1976:45), for example, suggests that some family types are more adapted to migration than others: "In many cases migrants come from extended families, both because they are large, and because the kinship network provides greater support, greater control, and greater capacity to replace missing workers."

Although it has been suggested that the extended family with its complicated kinship patterns of rights and obligations which are typical of many of the more "traditional" type societies inhibits both migration and modernization, there is growing evidence that this is not universally true (Christopher, 1965). Two related points will be discussed here:

- (1) the relative adaptability or flexibility of various family structures and residence patterns to migrate, and
- (2) the taking on of new functions by the extended family in the migration process.

Nash (1966) suggests that certain types of kinship and residence patterns make it easier for a society to adapt to migration. He points out that "a patrilocal residence pattern, involving local patrilineage segments and the minimal differentiation of agricultural tasks by sex within families enable the Mabwe tribe readily to incorporate male labor migration into the social system, whereas similar male migration created serious social problems for the matrilineal, matrilocal Bemba" (Connell et al., 1976:47). To put Nash's point into the framework of Figure 1, the

availability of the migration option is increased for an individual who knows that he or she is not leaving an unfillable role in the family labor force and social structure.

McEvoy (1971) indicates that the presence of patrilineally based kinship groups linked by siblings provides a group from which help can be requested when the spouse is absent in Sabo society.

Eames (1967:163) has suggested that the joint family, which consists of two or more siblings and their patrilineal relatives sharing residence, resources such as cattle and land, and household tasks, is a structure especially suited to labor migration of males in north Indian villages. Men typically go by themselves to the urban area, leaving their wives and children in the village. The remaining family is not abandoned in any sense, however, because they can rely on other members of the joint household. Eames proposes that migration in this context actually reinforces the joint family, drawing off surplus labor, and heightening the dependence of the small nuclear unit on the larger group.

Kemper (1977) deals with a similar point in his discussion of the changes which peasant households in Tzintzuntzan go through. Although the nuclear bilateral family is the basic unit of the village, "still most people reside in a household containing parts of two or more families at some time" (p.113). This flexibility in acceptable family structure and living arrangements is adaptive in the face of migration. The joint household often serves a transitional phase in both the community of origin and destination. Kemper describes the life-cycle of the family thus:

*"In sum, as peasants grow up, marry, have children, and eventually watch them depart, they belong to a series of nuclear, joint, and truncated households. These correspond to the requirements of different segments of the typical peasant family life cycle, and as such constitute a complementary, rather than antithetical aspect of the village social life."
(p.113)*

The flexibility of family and household structure in the village, combined with the potential support of family members already in the city increases the availability of the migration option as well as the expectation that the decision to migrate will lead to an improved economic situation.

From the studies previously discussed it is clear that the relationship between family or household structure and migration is an interactive one with feedback. Certain kinship and residence patterns may, in their flexibility, be especially suited to migration. On the other hand, the migration process may transform the structure and/or the functions of the family. This interaction is discussed by Gonzales (1961:1264). She proposes that family structure may influence the type of migration as well as the rate of migration. Five types of migration are identified: seasonal, temporary nonseasonal, recurrent, continuous, and permanent removal. Although Gonzales does not see any necessary major impact of seasonal or temporary nonseasonal migration on family structure, she suggests that "recurrent migration is clearly not consistent with a social organization which stresses the nuclear family as the basic domestic unit

except under very special circumstances" (1961:1268). In the case of the West Indian family, various aspects of the institution of the family as it has developed, including loosely defined parental roles as well as the cultural acceptability of foster parentage are especially suited to the conditions of migration (Philpott, 1968:15).

To put this in the context of Figure 1 if the society, through values and attitudes conveyed in the context of the family, has taught the individual that the only proper family is a husband, wife, and their offspring, and that the only appropriate caretakers for children are their biological mother and father, then the cognitive availability of the option of recurrent migration is greatly reduced, no matter how strong the motive or incentive. If, on the other hand, family structure and parental roles are diffuse as reported for the West Indian situation, a very different evaluation of options will result.

The second way in which the extended family relates to the migration decision making-process is by providing a preexisting structure or network of relationships which, in the face of migration, can take on new functions. (Chekki, 1974). The extended family can serve as the auspices for migration (Seil and De Jong, 1978). Numerous studies (Choldin, 1973; Blumberger and Bell, 1959; Litwak, 1960; MacDonald and MacDonald, 1964; Tilly and Brown, 1968; among others) support the suggestion that members of the extended family, both those in the home community, and those who have already migrated to other communities, provide information about migration options (increasing availability), support for the relative on arrival in the new community (increasing expectation), information about the socioeconomic situation in the new community (increasing incentive),

and a social group for the migrant to join in the new community. The existence of an extensive kinship network of rights and obligations which tie the new and the old community, providing a social, cultural, and economic continuity for the migrant is a very strong positive influence on the decision to migrate.

(3) Educational Characteristics

It has been seen that migrants tend to have certain demographic characteristics, and that certain socio-cultural systems are more conducive to migration than others. Additionally, migrants tend to be better educated than the general population in the areas which they leave (Goldstein et al., 1974) in Thailand. Other researchers have found that it is the better educated migrants who tend to be rural-urban migrants rather than rural-rural or urban-urban migrants. Spcare (1974) reports this finding for Taiwan, Goldstein et al. (1970) for Thailand, and Rengert and Rengert (1973) for Mexico.

Findley (1977) in an excellent review of causes and consequences of migration finds widespread support, in studies in Jamaica, Costa Rica, Ghana, Nigeria, Colombia, Taiwan, Mexico, and Thailand, for a positive relationship between education and rural-urban migration. She also cites broad-based evidence for the fact that desire for education is a major motive for migration. Simmons (1977) reports a similar finding.

Caldwell (1969), in a major study of labor migration in Ghana, found positive relationships between education, literacy, nonfarm occupational skills, and likelihood of rural-urban migration. Byerlee (1974) in an article reviewing African migration research, reports similar findings.

The mechanism by which education affects the motivation to migrate seem fairly clear. The availability of the migration option is greater for more educated individuals, in that they are more likely to have knowledge of opportunities in communities outside their own. Furthermore, expectancy, or the subjective probability of goal attainment is greater for educated individuals: their education or technical training increase the likelihood of finding a job in the urban area.

(4) Economic Characteristics of Migrants

In attempting to characterize the economic status of migrants, relative to the general population at origin, two groups emerge. Macisco, Bouvier, and Weller (1976), as well as Findley (1977), have suggested that there are "more mobile" and "less mobile" migrants. Speare (1974) in Taiwan and Essang and Mabawonku (1974) in Nigeria find that migrants come from higher income families. The relationship between economic status and propensity to migrate is clearly not a simple one, however, since wealthier people tend to have more education, which is itself related to migration decision-making. There is also variability, as we have mentioned earlier, among family members in propensity to migrate. Therefore, it is important to keep the household, the socioeconomic, and the environmental context in mind in attempting to evaluate motivational components of migration.

"More mobile" migrants who tend to be wealthier and more educated, and who have more knowledge of their destination, may be contrasted with "less-mobile" migrants. These individuals are typically motivated to migrate because of a lack of access to resources in the place of origin. Frequently lacking knowledge about job availability or technical training, these migrants are in a sense pushed out of the rural areas (Findley, 1977).

D. The Impact of Migration on Individual Migrants

(1) The Impact on Fertility - Diversity of Findings

In various studies, migrant fertility has been found to be higher than either the population of origin or destination (Hutchinson, 1961); lower than either the population of origin or destination (Macisco, 1970; Ritchey and Stokes, 1972); and somewhere intermediate between the two (Iutaka, Bock and Varnes, 1971; Macisco et al., 1969; Ritchey, 1973). It is clearly possible that all these findings may be correct; that they reflect a real variability in fertility characteristics of migrants and in fertility characteristics of receiving populations. An obvious point, but one which tends to be lost in arguments about whether migrant fertility goes up or down is that not all rural areas, not all migrants, and not all urban areas are the same.

(2) Structural Determinants of the Fertility Response

The decision to migrate results in a change from one environment to another. As Dutoit (1975:1) suggests, "cultural adaptability which allows adjustment to major ecological changes by mental abilities and technological skills" makes mobility or migration a viable option. Jackson, as well, argues strongly for what is essentially an adaptation approach: "The study of migration has been rather strongly segmented by sharp contrasts between before and after dichotomies, with very little systematic study of the disassociation or desocialization process involved in moving from one social milieu to another. The migrant to a new environment carries with him much of the old, and how much will depend on age, socialization, the circumstances of this departure, his personality, and much else"

(Jackson, 1971:2). The magnitude of the adjustment required will thus be dependent on the characteristics which the migrant brings with him, as well as the magnitude of the differences between the old and the new environment.

Although we have cited many studies which support the hypothesis that migrants are selected for low-fertility characteristics, other researchers have interpreted the fertility patterns of migrants to be the result of adaptation. Duncan (1965) in a reanalysis of 1962 Current Population Survey of the U.S. found fertility levels of migrants intermediate between rural non-migrants and urban non-migrants. The assumption underlying these studies is that migrants gradually adapt to their new environment. The reason that the fertility of migrants never actually matches that in the new environment is that the resocialization of migrants with regard to fertility in the urban area may be incomplete or children may have been born prior to the migration. This approach to the study of migrant fertility implies that degree of exposure the urban environment in interaction with the characteristics which the migrants bring with them from the original environment are important in the determination of fertility. Iutaka, Bock, and Varnes (1971:56), on the basis of data from urban Brazil, suggested that "urbanization involves not only migration to cities but exposure to urban environments and participation in urban complexes. The younger the age at migration, the more likely the migrant absorbs such urban attitudes, values, and behavior patterns as those regarding reproduction. Patterns of absorption depend on rural background, as well as social background and the social situation which

he enters." Martine (1973) also suggests, on the basis of Latin American data, that the earlier the age at migration and the longer the residence in the new population, the greater the impact on fertility.

The findings of Macisco et al. (1969:167) and Macisco (1965:157) are consistent with interpretation of fertility change as adaptation. They found that migrant or nonmigrant status in itself was not as important in the determination of fertility as the proportion of the reproductive years spent in the urban environment. Ritchey (1973:26) proposes a similar mechanism for fertility change whereby migration produces a conflict between the norms of the population of origin and the norms of the population of destination. The conflict is mediated by the length of exposure to the new environment as well as characteristics of the migrant such as marital status, education, and length of residence which determine their receptivity to the new environment.

All of these researchers mention one or more of the determinants of migrant response which we outlined earlier:

- (1) the magnitude of difference between the population of origin and the population of destination in social, economic, and cultural characteristics, as well as demographic patterns;
- (2) the relative duration of exposure to the population of origin as opposed to the population of destination;
- (3) the characteristics of migrants which tend to insulate them from the influence of the new environment; or conversely, characteristics of migrants which tend to

involve or expose them to the influence of the new environment; and

- (4) the characteristics of migrants which constrain their potential response to the environmental changes resulting from migration.

An example of the interaction of these four factors is found in a study by Harbison (1980) which examines the fertility of Samoan migrants to two types of communities on Oahu, Hawaii, more traditional communities and less traditional communities. Women who migrate to traditional communities on Oahu experience less environmental change, are exposed to the new environment for less of their reproductive period, have relatively fewer of the characteristics which would expose them to modernizing influences, and are more severely constrained by their past reproductive history. It is not surprising that their age specific fertility rates are very similar to the nonmigrant Samoans on Samoa. Migrants to the less traditional communities, on the other hand, are exposed to much greater environmental change for a larger portion of their reproductive years, have markedly lower age-specific fertility rates prior to migration, and have education and labor force characteristics which tend to expose them to modernizing influences. It appears that migrants to the less traditional communities are selected low age-specific fertility rates prior to migration, and have socioeconomic characteristics conducive to adaptation.

This very small scale case study demonstrates the interaction of selection and adaptation in determining the fertility response of migrants

and also highlights the importance of carefully defining the new environment to which migrants are exposed. While, in a sense, all Samoan migrants to Hawaii are rural-urban migrants, the migrants who go to the more traditional villages on Oahu find their new environments similar in many ways to their old environment socially and culturally.

It is, in fact, a fairly common pattern reported by anthropologists that migrants to cities from peasant communities form enclaves, develop support groups, and maintain social and cultural institutions similar to those of their original community. In cases such as these the magnitude of the difference in the two environments is greatly reduced and the probable impact of the migration process on fertility is correspondingly reduced.

Doughty (1970), for example in looking at the social adaptation of migrants to Lima, Peru, found that regional clubs, associations and fiestas reflect the social structure in the place of origin. He points out that, on the positive side, such institutions "tend to slow down the stressful pace of social and cultural change" (p.30) but that on the other hand, they also slow down the assimilation of the migrant into the urban environment. Buchler (1970) makes a similar point concerning the fiestas which link cities, towns, and peasant communities in Bolivia.

Various forms of extended kinship may also serve in the urban environment to create social groups of migrants from the same communities and to insulate them from modernizing influences. Bruner (1970) suggests that for the Toba Batak in the modern Indonesian city of Medan, the kinship system is extended to encompass a large residential group, providing

social ties among individuals in the urban environment. These studies demonstrate that it is critically important, in analyzing the fertility response of migrants, to have an accurate picture of the micro-environment, socio-cultural, economic, and demographic, which they leave and to which they go.

A similar point is made by Brattacharyya (1977) in looking at rural-urban differentials in income inequality, education, literacy, and ideal fertility in Turkey, Taiwan, and Morrocco. He found that in Taiwan, where the differences are less than in the other two countries, "urban fertility values have spread among the rural population." Once again, the point is strongly made that it is not sufficient simply to distinguish two categories - rural and urban. Each of these two categories encompasses such great variability that prediction of behavior (fertility or otherwise) on the basis of residence in one of these types of regions, is extremely risky.

We are emphasizing the structural context which is schematically represented on the right hand side of Figure 2. An urban migrant does not simply go to the city, he or she goes to a particular household, and a particular neighborhood within a particular region of the urban area. The Specific structural details of the new environment will affect the motivation and consequent decision to bear children.

(3) Demographic Determinants of the Fertility Response

Age is a major factor in determining the magnitude of the fertility response. Clearly if a woman, or couple, migrates to an urban area when they are 38 or 40, having already produced six children, the potential

for fertility reduction is severely constrained. Many researchers (Macisco et al., 1970; Goldstein, 1973; Iutaka, Lock, and Varnes, 1971, among others) have found minimal, if any fertility reduction among older migrants.

Marital status at migration may also be important in influencing fertility. If a woman migrates by herself to an urban area, delays marriage or is separated from her spouse for extended periods, this may have the effect of reducing fertility (Caldwell, 1969; Abu-Lughod, 1965). Later age at marriage of female migrants to urban areas may also contribute to fertility reductions.

(4) Educational Determinants of the Fertility Response

Age at migration, marital postponement, and marital separation as a result of migration constitute a reduction in the Davis-Blake exposure to intercourse variable and therefore the inference of their impact on fertility is fairly straightforward. Although findings are fairly consistent with respect to education, the interpretation of the mechanism by which this variable affects the fertility of migrants is more complicated. In the first place, education per se does not change fertility. It may change one or more of the various components of the motivation to have children, which will then lead to a behavioral change altering the Davis-Blake (1956) intermediate variables, exposure to intercourse or risk of pregnancy. Furthermore, education tend to be correlated with other variables such as female labor force participation and economic status, which themselves influence fertility.

Nevertheless, most researchers report that a significant portion of the rural-urban fertility differential can be accounted for by education (Schultz, 1969). Possible explanations for the way in which education influences fertility are numerous: education may increase the probability of labor force participation; it may increase contraceptive knowledge and practise; it may reduce "traditionalism" and family oriented values; and it may increase both the relative and opportunity costs of childbearing. The assumptions built into each of these interpretations will be discussed at greater length in the following section. We will review here the evidence of selection and adaptation in the educational impact of migrant fertility response.

(5) Changes in Labor Force Participation

The selection of female migrants for relatively higher levels of education than the original population in general has already been reviewed. These women, when they encounter the increased job opportunities of the urban labor market, are apt to take jobs outside the home which are incompatible with childrearing. In this case, the determination of fertility is a two-step causal sequence involving both selection and adaptation. Women with more education are more likely to migrate, and having migrated are more likely to join the labor force (Graff, 1979; Findley, 1977). Having joined the labor force, they are more apt to limit the size of their families. For example, Macisco, Bouvier, and Weller (1970) found that when they controlled for education migrant women who worked outside the home had 18 percent fewer children than those who do not.

Since economic considerations are the single most frequently cited reason for migration (Todaro, 1976), it is not surprising that many

female migrants join the labor force and that this has an impact on fertility. In fact, Jelin (1977) finds that for recent migrants to Santiago, labor force participation rates among migrants are even higher than for native women. She looks in detail at the situation of the single female migrants who most frequently take a position as domestic servant. They receive food and shelter as part of their salary, and frequently educational opportunities as well. Typically their long range goal is to marry and raise a family, but this goal is postponed for an average of seven years. The experience of these women in their new environment and their exposure to modernizing influences is very different from women who migrated as part of an already established family unit.

Numerous studies have documented the inverse relationship between female labor force participation and fertility (Findley, 1977:67; Fong, 1976). Because women are more likely to work after they have migrated to an urban area, labor force participation can be viewed as one mechanism whereby migration affects fertility. However, as with education, interpretation of the relationship is somewhat complicated. It may be that rather than labor force participation causing reduced fertility, both the decision to work and the decision to limit family size are the outcomes of a household decision-making process aimed at maximizing resource utilization, including human capital.

(6) Changes in Values and Attitudes

Finally, migration may lead to a fertility reduction by reducing "traditionalism" or by changing attitude and values related to high fertility. Here the results of empirical studies are mixed. In looking at fertility aspirations and modernization in urban regions of Uganda,

Thompson (1978) discusses what he calls "resilient cultural values." In contrasting rural and urban ideal fertility, he found that indicators of modernity are not associated with a desire for fewer children among non-urban segments of the population. Even among urbanites there is no simple relationship between fertility aspirations and modernity. For example, among the relatively well-educated, economically advantaged they found cultural values which supported high fertility and the persistence of large families. Due to prevailing social and economic conditions the desire for large families in urban areas may be suppressed, but Thompson suggests that, at least in Africa, once financial security is attained, traditional high fertility patterns will reemerge.

Zarate (1967) makes a similar point, distinguishing between urbanization and urbanism. As Findley (1977) suggests, "Families may live and prosper in the city, but their family size patterns are still determined largely by a rural or traditional culture."

On the other hand, there is considerable support in the literature for the hypothesis that urban migrants when exposed to modernizing influences, change their attitudes toward fertility. Card (1978) for example, found that with increasing exposure to U.S. culture, knowledge about reproduction and birth control, the attitudes of female Philippine migrants to the U.S. toward large family size became less favorable, the desire for additional children decreased, and the corresponding motivation to avoid another conception increased. The most important factor, according to Card, in changing fertility patterns was a shift in attitude, from viewing children as "natural and essential" to viewing them as optional.

Thus far, we have considered the development of low fertility attitudes as an adaptive response to a new environment. It may also be, however, that selection is also playing a role. Kong (1976), on the basis of analysis of the 1970 Korean Census, suggests that migration may select women (or couples) who already have low fertility attitudes and are motivated to have fewer children. Similarly, Hendershot (1976) defines selection as "being sensitive to the urban negative effect on fertility."

Whether migrants are of the more mobile or less mobile type, whether adaptation or selection is predominating, and what motivations are predominating in the migration decision, combined with the volume of the migration stream will determine the net regional impacts of migration. In the following section we review the literature relating to regional impacts of migration.

E. The Net Regional Impact of Migration on Fertility

(1) Consequences for the Rural Origin

The net regional impact of migration on fertility on both the place of origin and destination will depend on the processes of adaptation, selection, and volume of the migration stream. Since in the most general case, migration puts individuals from a high fertility area into a low fertility area, it might be expected that migration would raise the fertility of the urban destination and, do nothing to the fertility rate at origin, assuming the migrants are representative of the original population at large. But migrants are typically not representative, and this fact precludes any simple statement of the impact of migration on the original region.

The migrating unit may be important in determining regional fertility impacts. If, as in many African countries, single males migrate, leaving

their wives at home in the village, it is likely that the fertility of these women will be correspondingly reduced. Studies from New Guinea, India, and West Africa support this hypothesis (Connell et al., 1974; Rempel and Lobdell, 1976).

When the migrating unit is a couple, selection tends to favor young adults in the prime reproductive ages. By pulling these people out of the age distribution, general fertility measures such as the crude birth rate may be reduced. However, in addition to being young, migrants may be better educated and predisposed toward lower fertility (Hendershot, 1976), complicating the hypothesized relationship.

Simmons (1977) points out that in Africa, where migration of single young males is common, women may take over the agricultural tasks usually performed by males. If their daily subsistence activities are changed in a major way, there may be an impact on fertility. These relationships have not yet been investigated in detail empirically.

We have cited in this and other sections considerable evidence that migrants are selected for particular characteristics. Morrison (1973) suggests that more skilled and highly qualified members of the rural labor force are more likely to make the decision to migrate. Migrants also tend to be young people with relatively higher levels of education. The impact of all this on regional fertility is ambiguous. Relationships must be investigated empirically in particular socio-cultural, environmental, and household situations.

(2) Consequences for the Urban Regions Receiving Migrants

There are similar problems in generalizing about the fertility impact of migration on urban receiving areas. The flow of migration streams

clearly increases urban population growth rates; it may or may not increase fertility rates, depending on selection and adaptation. If migrants are selected for low fertility characteristics and additionally adapt rapidly to their new environment, it is likely that the regional fertility impact will be minimal. This is the pattern Hendershot (1976) finds in Philippine migrants to Manila.

On the other hand, we have also described cases where migrants form communities or enclaves within the urban area and continue to live in a way very similar to the way they did prior to migration. In this type of situation it is expected that adaptation will be minimal. If the migrants maintain significantly higher fertility rates than the urban natives and if the volume of migration is sufficiently large, urban regional rates may be raised. A large amount of empirical work is still required in order to evaluate regional impacts at destination - on fertility as well as numerous socioeconomic and cultural factors including unemployment rates and migrant adjustment, both economic and social.

In summary, recent research has indicated that potential migrants are influenced by the regional characteristics of the place in which they live as well as by characteristics of alternative destinations. Economic factors appear to be primary. The scarcity of jobs, shortages of resources, and low return to labor in the rural area, combined with the expectation of higher paying work in the urban area are important inputs to the migration decision. In addition to regional characteristics, the way in which individual characteristics of migrants (such as education, economic status, and family size) influence both the decision-making process prior to migration and the adjustment to the new environment after migration was reviewed.

Characteristics of migrants which tend to be related to a major adjustment in fertility patterns include higher levels of education, female labor force participation, and relatively young age at migration. We have attempted to develop a general picture of the regional and individual factors involved in migration and fertility decisions. Greater detail and documentation for the patterns described here may be found in Appendix 1.

PART IV

The Decision-Making Approach to Fertility and Migration:
Previous Theoretical Work and Suggestions for a New Synthesis

A. Introductory Comments

The suggestion that both fertility and migration may be viewed as outcomes of decision-making processes is not a new one. Burch (1978), as we discussed earlier, argues strongly for a general decision-making approach to all demographic behavior. Findley *et al.* (1978), as well, in their thorough review of the literature relating to migration, fertility and rural development programs, suggest that, "fertility decisions are not carried out independently of other household decision-making. Rather, they are determined interdependently . . . If fertility decisions influence, and are influenced by other household decisions (such as migration) seriously biased forecasts of the fertility impacts of rural development programs may result from failing to take account of the interactions between these and other household decisions" (p.2).

They utilize the framework originally developed by Easterlin (1973, 1975) which, in a three-equation model, specifies the determinants of (or decision functions for) the demand for children, the supply of children, and voluntary constraints on the supply of children. To these three functions is added a migration decision-making function. They suggest that income, relative costs, and tastes and preferences are major influences on fertility decisions and that these factors, as well as information and distance from urban areas determine the migration decision.

This approach constitutes a major step toward a general understanding of demographic decision-making. We feel that further insights may be

gained from several modifications and additions to the approach. In this section we will review the major decision-making approaches to both fertility and migration, relating them to the framework presented in Figure 1. Emphasis will be placed on what each of the various theories assumes implicitly and explicitly about the motivational components of decision-making. Following this review, we will suggest a model for the joint determination of migration and fertility decisions. Our model incorporates those factors included in Figure 1 - the environmental, socio-cultural and household contexts of decision-making, and the developmental, sequential nature of demographic decisions. Just as it is inaccurate to suggest that a fertility decision is made once and for all, so also the option to migrate is evaluated at various times in the life-cycle of the individual and the family. Therefore, the model we propose is for the outcome of a particular decision, the dependent variable being the probability of deciding to have an additional child, or the probability of moving to place j , given residence on place i .

B. Theoretical Approaches to Fertility Decision-Making

In Figure 1 we presented a schematic representation of the links between the environment, the society, the household, and the individual who makes a decision regarding fertility or migration. We have suggested that the function of each of these linkages affects one or more of the motivational components of decision-making: availability, motive, expectancy and incentive.

Since the family or household is the most immediate context for an individual, it has a major impact on decision-making. The family is for the individual a source of subsistence, socialization and training,

information, social relations and support overtime, as well as the context of decision-making and economic maximization. For example, in an extended family household where rights and obligations delineated by kinship remain strong, the individual's well-being is determined by the average well-being of the household, and by his relative position in the internal power structure of the household. In such a situation it is not sufficient to compare some measure of the average wage in the place of origin to the average wage in the place of destination. Rather, a comparison of the relative well-being of the migrant within the extended family prior to migration with his potential well-being within a particular household unit after migration is necessary.

Although there is wide variability in both structure and function among societies, the family is the context of migration and fertility decisions for most individuals. The family within which a decision is made may be either nuclear or extended, it may patrilineally or matrilineally structured, and it may be either the family of orientation or procreation. Whatever the specific structural type, the family as the link between the individual and the larger society, trains the individuals in the values and norms of that society, provides the individual with information about opportunities in his own community and others, specifies kinship rights and obligations, and defines appropriate economic roles for family members. In most societies it is the subsistence unit, serving as the link between the individual and the environment: an individual's access to resources is acquired through family holdings. The size and age-structure of the family, the size of holdings, the subsistence base, and the level of technology will determine the demand for and return to labor of an individual within the family.

The specific nature of the links between the individual, the family, and society, and the environment will determine the direction of their impact on migration and fertility decisions.

Because we consider these structural and functional characteristics of family and household to be absolutely critical in understanding individual decision-making, we will review three major theoretical approaches to fertility decision making focussing on: (1) assumptions made about the structural context of decision-making; (2) the determinants of motivation; and (3) the interaction among various motivational components in determining outcome.

Perhaps the most widely discussed framework for the analysis of fertility decision is the economic theory of fertility, which proposes that "fertility is determined by relative costs, both monetary and non-monetary, opportunities, both market and nonmarket, and preferences or tastes (Keeley, 1976:112). Keeley holds that, although the theory is far from completed and there is "far too little known empirically, the approach does consider systematically the effects of social, economic and cultural variables on fertility" (p.112).

Williams (1976) points out that, according to this approach, fertility behavior may be viewed as the outcome of a rational decision, aiming at the utility maximization of the household: "The couple is seen as maximizing their utility in a situation where their wealth, the relative prices they face, the technological environment, and their preferences are given" (p.121).

We will examine in detail a particular version of the economic theory of fertility, the "new household economics." An earlier version of this

approach put forth by Leibenstein (1958) was modified slightly by Becker (1960) and later developed by Schultz, Willis and Nerlove, among others. Nerlove (1974) has summarized the major elements of the approach:

The four main elements of the theoretical structure of the new home economics are: (1) a utility function with arguments which are not physical commodities but home-produced bundles of satisfactions; (2) a household production technology; (3) an external labor market environment providing the means for transforming household resources into market commodities; and (4) a set of household resources constraints which consist of inherited material wealth and time available to individual family members for household production and market activities. The time available may be of varying quality, and it is at this point that inherited human capital and investments in human capital made both by one generation on behalf of future generations and on its own behalf, enter the picture. (Nerlove, 1974, p.3)

The relevant questions here are the utility of such an approach in an LDC setting, the validity of the assumptions, the testability of the propositions, and in particular the applicability to the fertility of migrants. We will address the last question first because the answer is the most clearcut. There are major problems in applying the new household economics model of fertility decision-making to migrant fertility in LDC's.

One of the major problems centers around assumptions made by economists regarding tastes. Becker (1976) states that "economists generally take tastes as given and work out the consequences of changes in prices, income and other variables under the assumption that tastes do not change" (p.817). Making this assumption, economists have tended to contrast the costs of children in rural as opposed to urban areas. Increased cost of children in urban areas has been suggested as an explanation for reductions in migrant fertility.

It seems very likely that this is true. For example, Williams (1976) suggests that in moving away from labor intensive agriculture and into urban areas, the reduced number of productive opportunities for children, combined with compulsory education and relatively high food and housing costs, children become significantly more expensive. Tienda (1979) provides empirical support from a survey of labor force participation of children in rural and urban regions of Peru. She found that children living with their own family are more than twice as likely to be economically active if they are living in a rural area as opposed to an urban area.

It is clearly a very questionable assumption that as the relative costs of children are rising, the tastes and preferences of migrants for children remain constant. Thinking in terms of Figure 1, when an individual moves from one socio-cultural and household environment to another, it is very likely that the motivations concerning childbearing will change as well. The literature dealing with the impact of modernization on attitudes (Inkeles, 1974) provides ample support for the idea that tastes and preferences of individuals change as they are exposed to changing socio-cultural systems.

Williams (1976), recognizing this point, suggests that "both individual norms and cultural preferences change in the process of modernization. The new opportunities and new aspirations lead not only to changes in desired family size, but in ability to achieve it" (p.124).

There are several other major problems in applying the "new household economics" model to analysis of migrant fertility decisions. Since the approach makes no attempt to deal with the larger context within

which fertility decisions are made, the cross-cultural utility of the model seems questionable. In fact, the most likely sources of fertility change in migrants, changes in the socio-cultural system and changes in household structure, which lead to changes in the components of motivation, are totally ignored.

Our main reservation with an approach such as the new household economics is that it fails to take into account what we know about how individuals are influenced by their environment and how their immediate environment, their household, influences the way in which they evaluate various motivational components and make a decision. We strongly agree with Williams (1976) statement that "it appears research emphases should shift from the aggregates of urbanization or industrialization to describing and explaining the decisions of individual households" (p.142).

A different type of approach altogether to the analysis of fertility decision-making is found in the large multi-nation study, referred to as the Value of Children Studies (Fawcett, 1972; 1976). These surveys, which collected comparable data for numerous countries, are based on a psychologically-oriented theoretical framework developed by Hoffman (1973). Her approach centers around the key concept of value:

The value of children refers to the functions they serve for their parents or the needs they fulfill. The specific values, as we conceptualized them, are anchored in particular psychological needs; they are also tied to the social structure and thus subject to cultural variation and social change. They can be fulfilled by some aspects of parenthood, although alternative ways of fulfilling them may also be possible. (Hoffman, 1973, p.26)

Her scheme lists nine basic values, including status and identity, immortality, group norms, affection, stimulation, achievement, power, social competition, and economic utility. The fact that economic utility is simply one of nine basic values, rather than a prime mover, indicates the major differences between this approach and the new household economics. The additional dimensions, however, present methodological and analytic problems. Is there a ranking of the values? What determines which value an individual will attempt to maximize first? How do competing values interact to determine motivation? These unresolved issues make prediction from the model difficult.

In addition to the general issues relating to the framework, additional complications arise in applying the approach for the analysis of the fertility of migrants. If one holds that values are the main determinants of fertility, the next question is what determines values. If values are determined by environmental, household, and socio-cultural factors, then it is likely that two sets of values will be involved in migrant fertility, those desociated with the rural area and those associated with the urban area. There are, of course, other approaches to the study of fertility. An attempt to isolate commonalities and differences among psychological, economic, sociological and anthropological theories may be found in Robinson and Harbison (1980).

C. Theoretical Approaches to Migration Decision Making

In the first major statement of the human capital theory of migration Sjaastad (1962) described the "Costs and Returns of Human Migration." He proposed that people move when the benefits, both monetary and non-monetary, exceed the costs, both monetary and nonmonetary. The model makes several assumptions about migration decision making. First it assumes that the process is rational and maximizing - an individual will always move if benefits exceed costs, and will move to that location where the positive difference between benefits and costs is maximized.

The issue of knowledge of alternative locations and the associated costs is critical. It seems clear that for several reasons individuals do not always have perfect knowledge of alternatives. Information may simply be available; or information may be biased or inaccurate in some way; or the potential migrant may not even consider certain locations because of "cognitive availability." One major factor which influences the kind of information and the source of information which is considered is the structure of the household or family and the previous migration experience of its members.

Ritchey (1976) for example has suggested that the family influences migration decision-making in at least three ways: (1) "The presence of relatives and friends is a valued aspects of life that constrains perception of migration options. If however, family members have already migrated this may increase the liklihood of migration." These considerations are referred to as the affinity hypothesis. (2) "The distant location of family encourages and directs migration through increasing

potential migrants' awareness of conditions, particularly with respect to job conditions, at the distant location." This is referred to as the information hypothesis. (3) Finally, family may "increase the individual's potential for adjustment through the availability of aid in relocation at an alternate area of residence." This is referred to as the facilitating hypothesis (Ritchey, 1974:389). Although only one of these hypothesis is referred to as the information hypothesis, all relate to availability of information and factors relevant to the decision making-process. The general hypothesis, suggested by all three of these factors is that the likelihood of selecting a particular destination is greatly increased if other family members (or in some cases other community members) have gone there previously.

There is ample support for the hypothesis that family and friends influence migration. Levy and Wadycki (1973), in analyzing Venezuelan census data from 1960-1961, found that, on a regional level, past migration patterns (as well as distance, male wage rate, literacy, and level of urbanization) do affect current migration flows. Collier (1978), as well, emphasizes the importance of networks of information and communication in directing migration streams. Looking at data on Jamaican immigrants to the U.S., he analyzes patterns of concentration of immigrants, using a dissemination of information model. He contrasts his analysis to a strictly economic approach, suggesting that "By specifying a particular type of social network as the mechanism which conveys information, we have shown that there is apt to be a systematic bias in sub-operational choices of decision" (p.34).

It seems likely that the decision making process of the migrant may fall into two stages: the decision to move and the decision where to move. The availability of information and previous family migration history will very likely affect both of these decisions. Aspects of the environment, sociocultural system, or household structure which influence an individual's access to resources, on the other hand, are more likely to have an impact on the first stage of the decision-making process.

On the household level, the age-sex structure of the family and life-cycle state are aspects of the demographic structure of the family which may influence migration decision-making. Looking again at Figure 1 it can be seen that the family, as the subsistence unit, defines access to resources of various family members. Connell (1976:46) points out that birth order and number of sons in the family may be very important in determining who migrates, depending on inheritance rules. Kasdan (1964:345), in examining the social and economic structure of a Basque village, suggests that male primogeniture (that is, inheritance by the eldest male) increases the probability that higher parity sons will migrate. Kasdan also makes the same point suggested earlier in his paper: migration is only one of a number of possible responses (or decision outcomes) to a particular structural situation. In the Basque village, alternative options to migration for later born sons are nonfarm careers in the village - in the church, as an artisan, shepherd or sailor.

A slightly different interpretation of the relationship between family size and migration decision-making is that large family size increases the incentive to migrate for a given family member. If inheritance is partible, the presence of a large number of siblings in

the household increases the likelihood that one individual's share of the family land will be insufficient to support an independent household. Thus family size, or more precisely number of siblings, may act as a "push factor." Although traditional applications of push-pull models of migration (Stouffer, 1940; 1960) sometimes make individuals appear to be pieces on a chess board, moved about by structural factors, the approach is nevertheless useful when combined with a motivational decision-making approach. Push factors are those characteristics of the population of origin which lead an individual to expect that his incentives or goals are more apt to be achieved elsewhere.

It should be noted that the impact of family size on the migration decision will depend on the ecological and socio-economic context. Where new lands are available to be brought under cultivation relatively easily, large family size may not constitute a push factor toward migration. In terms of the socio-economic context, townward migration as a way of diversifying the "family economic portfolio" presupposes the existence of an unsaturated labor market and knowledge of the market by the potential migrant. If such a labor market does not exist, or if there is not knowledge of the market, some other adaptive response to large family size may be made. For example, a shift might be made to more intensive cultivation in order to increase productivity. Migration is only one of a number of possible responses to large family size or population pressure. If large family size provides the incentive for migration, it will be selected only if availability, motive, and expectancy are present as well.

There is a very large number of studies relating access to resources, land-holding systems, and family structure to the decision to migrate.

For example, R. Paul Shaw (1974) in an excellent study of "Land tenure and the rural exodus in Chile, Colombia, Costa Rica, and Peru," found that out-migration was related to lack of credit for the rural poor, lack of markets, and low rural wages.

Over and over again, "economic reasons" or "better employment opportunities" are cited as the major factor in the decision to migrate (MacDonald and MacDonald, 1968; Greenwood, 1971; Connell et al., 1976; see Findley, 1977 for summary of studies reporting this finding). Correspondingly, any technological or social change which influences the access of individuals to resources or the rural requirements for labor are likely to affect motivations to migrate. Romero and Flinn (1976) for example, found that commercialization in agriculture was positively related to the rural out-migration rate. Rhenberg (1977) as well looking at 1960-1970 South Korean data, found a relationship between the state of the rural economy and the migration rate. The data suggested that low agricultural prices were positively related to the migration rate.

In a good summary of early work in this field, Brigg (1973), like many other researchers cited, found that education, contact with previous migrants, present economic or employment situation, and anticipated urban income were significantly related to the decision to migrate. Of these factors, one - the economic situation in the rural areas, relates access to resources, and the other three relate to availability of information, perceived options, and evaluation of alternatives. These findings are representative of the bulk of the migration research of the past several decades.

D. Household Maximization

Having reviewed the major decision-making approaches to migration and fertility and related theme to the framework presented in Figure 1 some striking similarities emerge. In the first part of this section we will analyze the similarities and differences between migration and fertility decision-making processes. These become clear when migration and fertility decisions are viewed as part of a single household maximization process. Determinants and constraints on the decision-making process will be discussed and a preliminary analytic model developed. Although the proposed here is exploratory, it is intended to counteract the tendency in the literature to focus on an individual or an aggregate rates independent of the household context within which decisions are made. We wish to emphasize the interdependence of decisions themselves.

In examining economic approaches to fertility and migration, similarities become clear when a decision-making approach is taken. Although obviously there are some differences, when we look at the nature of the decision-making process, the context of that process, the appropriate unit of analysis, the constraining factors and the relevant planning horizon, the marked similarities suggest that we are really dealing with two examples of the same household maximization process.

The assumption that is made in taking any microeconomic approach to fertility (Becker, 1960; Schultz, 1969; Easterlin, 1975) or migration (Harris and Todaro, 1970; Byerlee, 1974; Todaro, 1976; among others) is that the decision-making process is rational. Williams (1976)

summarizing the work of Becker, Freedman, Easterlin, and Schultz, points out that all assume a utility-maximization framework: "fertility is assumed to be the outcome of a set of rational decisions that weigh both costs and benefits" (p.120). Most migration analysis also assumes "privately rational economic calculations. As decision-makers migrants consider the various labor markets available to them as between, say, the rural and the urban sectors, and choose the one which maximizes their expected gains from migration" (Todaro, 1976:28). So in the case of both migration and fertility we are assuming an economic maximizing process whereby perceived costs are subtracted from perceived or anticipated benefits. A positive decision results (the decision to migrate, or the decision to have a child) if the benefits are greater than the costs.

It should be noted here that with both fertility and migration decisions we are dealing with expected or perceived returns rather than actual returns. Only in retrospect do the actual costs and returns of having a child become clear; the same may be said of migration. Since individuals are making decisions on the basis of expected costs and benefits, we are interested here in modelling the determinants of those expectations.

A second similarity between fertility and migration decisions is in the context of the decision and the appropriate unit of analysis. Williams (1976) suggests that the appropriate framework for the analysis of fertility focusses on "the point of view of the individual household which chooses its fertility behavior from alternatives available in a given environment" (p.119). The individual couple is the primary

decision-making unit, and the context of the decision is the household existing within a larger socio-cultural and natural environment. This emphasis is perfectly consistent with the framework presented in Figure 1.

Current household structure, which is determined by past reproductive decisions of the couple, the socio-cultural and economic systems and the resources available to the household, is the context of the migration decision. This context, in interaction with characteristics of the individual migrant (education, age, socioeconomic status, etc.) will determine the components of motivation, that is, availability, expectancy, incentive and motive. These components, in turn, determine perceived costs and benefits of bearing an additional child or of migrating. Similarly, with migration decisions, aspects of the environment, the socio-cultural system, and the household interact with characteristics on the individual couple to determine the propensity to migrate.

Thus far, we have suggested that the context, the unit of analysis, and the function which is being maximized are similar for migration and fertility decisions. In terms of consequences for future decision-making, there is a major difference. Whereas the decision to have a child simply adds one more individual to the household, the decision to migrate, and consequent migration changes the relevant context of all future household decisions. Migration from a rural to an urban area, as seen in Figure 1, can result in a new environmental, socio-cultural, economic and household context for decision making. Williams (1976) suggests that such a shift will result in change in the value and costs associated with children, the status of women as income producers, the availability

of consumer goods and services, the cost of living, the availability of information, and numerous other factors likely to affect the motivational components of both fertility and migration decisions.

For these reasons, it seems inappropriate to estimate a single function for the determinants of completed migrant fertility. There is clearly a set of premigration contextual determinants and a different postmigration set. In looking at rural-urban migration, these contextual factors are likely to differ in major ways. Therefore a framework, such as that represented schematically in Figure 2, is essential to an improved understanding of migrant fertility. The two-stage approach of Figures 1 and 2 identifies one of the major problems with a new household economics approach to the fertility of migrants. As we have already suggested, the assumption that tastes and preferences (for children) remain constant when major contextual factors impinging on the individual change is at best questionable.

As well as context, unit of analysis, and maximizing process, fertility and migration decisions may be compared with respect to motivational components. However, some degree of "translation" is necessary to see that the relative prices, income, technology and preferences used by economists refer to what we have called contextual factors and motivational components. For example, the relative price of an additional child will be determined by such socio-cultural and household characteristics as education costs, alternative child-care personnel in the household, etc. These considerations will determine the availability of the "additional child option." Incentive simply refers to the outcome of the cost-benefit calculation.

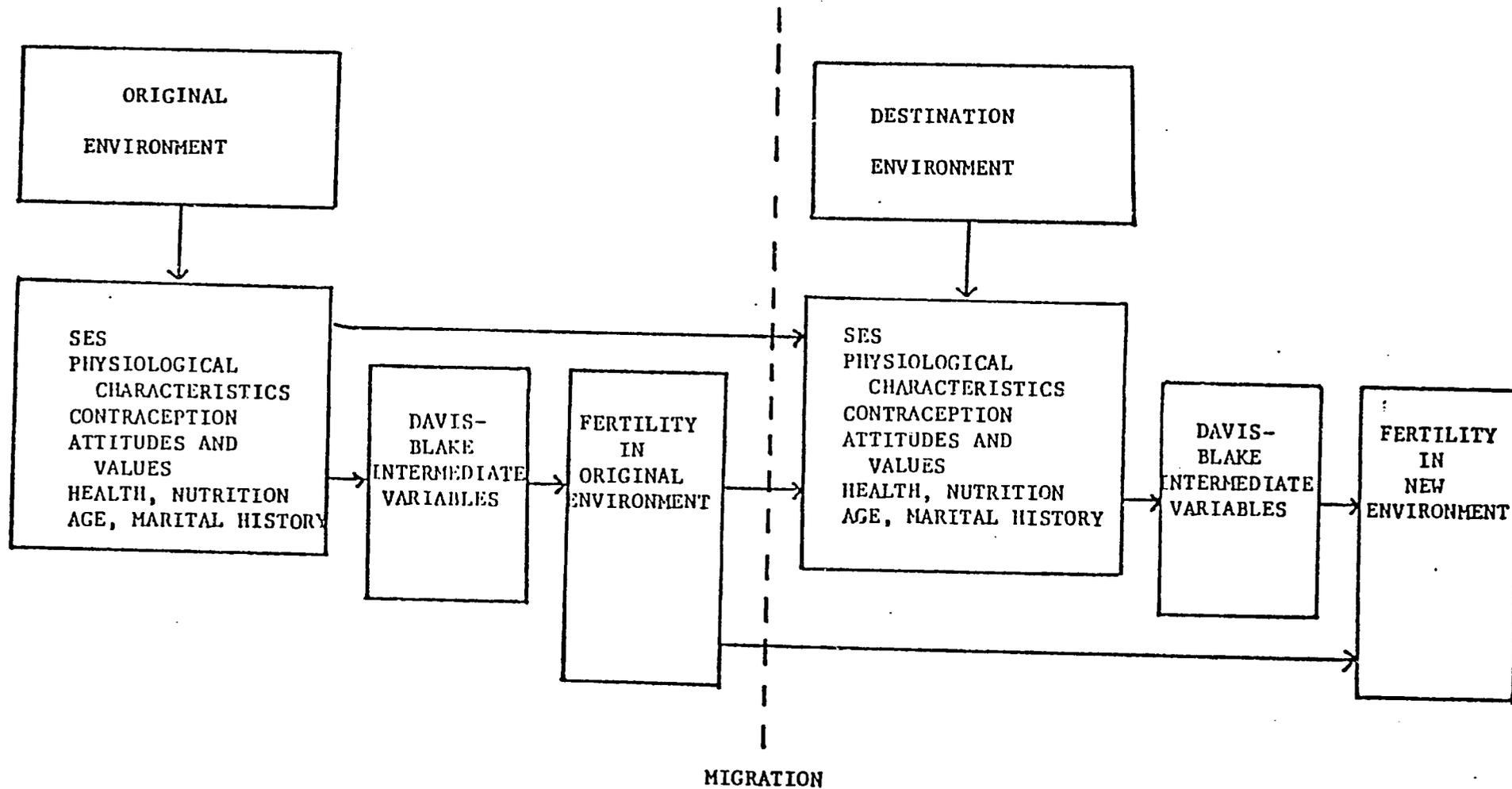


FIGURE 2 GENERAL MODEL FOR THE DETERMINANTS OF MIGRANT FERTILITY

Finally, we need to compare and contrast fertility and migration decisions with respect to the scope of the planning horizon. If we are attempting to model the decision to have an additional child, then the planning horizon seems similar to that of the migration decision. In both cases, the present state (number of children already in family, or present place of residence) is compared with some alternative state. If the benefits derived from the new state are expected to exceed the costs incurred in achieving that state, the outcome will be positive. The decision about completed family size is more difficult to compare with migration for several reasons. It seems likely, for example, that although a couple may make a family size decision at one time, this decision may be modified during the life cycle of the individual.

E. Specification of a Household Maximization Model - Some Preliminary Suggestions

If it is actually the case that fertility and migration decisions are part of the same household maximization process, then it may be possible to generate functions of the same form and compare the magnitude of impact of several independent variables on the decision-making processes involved in migration and fertility. In this section we will summarize Burch's (1978) specification of the decision to migrate, and will present at the same time the analogous model for fertility decisions. The somewhat more formal nature of this section of the paper serves to pin-point the functional similarities between the two processes. Following this discussion we will relate the model as developed to Hay's estimated micro-function for migration discussed by Todaro (1976). Necessary modifications of the function for application to fertility are considered.

Burch (1978) develops a micro-model for individual migration decision-making viewed as a function of motivation and costs. We will describe Burch's model for migration below on the left and propose the analogous steps of the fertility decision-making model on the right.

Assume:

MIGRATION = $f(\text{costs, motivation})$

FERTILITY = $f(\text{costs, motivation})$

Let

Motivation = the difference in perceived utility between two states

Motivation for Migration

The difference between the perceived utility of place a and place b

Let

\hat{O} = perceived utility at origin

\hat{D} = perceived utility at destination

\hat{C}_m = perceived costs of migration

Assume:

The greater $(\hat{D} - \hat{O}) - \hat{C}_m$, the greater p(move)

Let

\hat{I}_r = ideal residence

then motivation results

from $\hat{I}_r - \hat{D} < \hat{I}_r - \hat{O}$

Motivation for Fertility

The difference between the perceived utility of having x children and (x + 1) children

\hat{F}_1 = perceived utility of present number children

\hat{F}_2 = perceived utility of $(\hat{F}_1 + 1)$ children

\hat{C}_f = perceived costs of an additional child

Assume:

The greater $(\hat{F}_2 - \hat{F}_1) - \hat{C}_f$, the greater the probability an additional birth will be desired

Let

\hat{I}_f = ideal family size

then motivation results from

$\hat{I}_f - \hat{F}_2 < \hat{I}_f - \hat{F}_1$

that is:

The discrepancy between the ideal and some alternative state is less than the difference between the ideal and the present state.

Assume:

That both \hat{I}_r and \hat{I}_f are "realistic ideals" determined by a) income, b) prices, and c) tastes (see Easterlin, 1975).

Assume:

$\hat{D}, \hat{O}, \hat{I}_r$ are of the form $\sum_{i=1}^n p_i v_i$

where

p_i = perceived probability residence will yield a particular reward

v_i = value of the reward

Assume:

$\hat{F}_2, \hat{F}_1, \hat{I}_f$ are of the form $\sum_{i=1}^n p_i v_i$

where

p_i = perceived probability of survival of child to adulthood

v_i = values or rewards from child

Impact of the planning horizon on returns to investment:

Migration:

$$\hat{D} - \hat{O} = f(\hat{d}, \hat{o}, r)$$

perceived gain

where:

\hat{d}, \hat{o} refers to immediate rewards

t the time horizon

r the discount rate

a possible formulation:

$$\hat{D} - \hat{O} = \sum_{j=1}^t (\hat{d} - \hat{o}) e^{-rt}$$

implications:

- (1) "The longer the planning horizon, the more likely perceived benefits will outweigh perceived costs"
- (2) The more heavily one discounts the future, the less likely perceived benefits will exceed costs

The Fertility Analog is:

$$\hat{F}_2 - \hat{F}_1 = f(\hat{f}_2, \hat{f}_1, r)$$

where:

\hat{f}_1, \hat{f}_2 refers to immediate rewards of childbearing
 t the time horizon
 r the discount rate

a possible formulation:

$$\hat{F}_2 - \hat{F}_1 = \sum_{j=1}^t (\hat{f}_2 - \hat{f}_1) e^{-rt}$$

implications:

- (1) The longer the relevant planning horizon, the more likely the perceived benefits will exceed perceived costs.

If we mean by relevant planning horizon, that period over which interaction in the context of the household or the home community is expected, it seems likely that t is larger in nonindustrial societies and many LDC's. In fact numerous surveys have found "security in old age" to be a reason frequently cited for having a large number of children.

- (2) The more heavily one discounts the future, the less likely perceived benefits will exceed costs.

Burch discusses several additional factors, including knowledge of alternatives and search behavior, determinants of knowledge, and an application of the model to differential propensity by age to migrate. The points covered thus far, however, are sufficient to demonstrate the compatibility of both migration and fertility decisions to the model specified.

Now we would like to put Burch's model for migration in the context of Figure 1 and propose a micro-function for the migration of fertility decision which incorporates social, cultural, and economic factors included in the scheme. We have suggested repeatedly throughout this review that individuals make decisions on the basis of perceived options. An approach which attempts to analyze the determinants of perception must link the structural, contextual factors on the left hand side of Figure 1 with the components of motivation; that is, the costs and rewards. Todaro (1976:48) suggests that in micro-modeling we are asking the question "What is the probability or propensity that an individual will migrate from source area i to destination j if he has certain socioeconomic and demographic characteristics and if differential economic opportunities in i and j can be specified" (p.48). He goes on to list those characteristics which are related to the propensity to migrate: "age, sex, level of schooling, level of skills, range of personal contacts in the destination region (through perhaps tribal, religious or ethnic affiliation) of the individual" (Todaro, 1976:48).

A decision-making approach which emphasizes the determinants of individual behavior requires an empirical test that is based on individual level data. The dependent variable must be specified as a measure of

migration rate. In modeling the outcome of a decision-making process, the dependent variable will be dichotomous, taking the value of 1 if the outcome is positive and 0 if the outcome is negative. Hay's (1974) study of migration in Tunisia provides a good example of this type of micro-function. The actual micro-function which Hay estimated is listed below:

$$P = f(S, SK, INF, AGE, AGE^2, MAR, HAMAN, Y_C)$$

where:

S = years of schooling and formal occupational training

SK = a dummy variable equal to 1 for those with job-learned transferable skills and equal to 0 otherwise

INF = a dummy variable for those who knew someone who could help in obtaining an urban job and 0 otherwise

AGE = age at the time of survey for nonmigrants and at the time of migration for migrants

MAR = a dummy variable equal to 1 if married and 0 otherwise

HAMAN = the number of hectares per active man farmed by the individual household (a proxy measure of farm income)

Y_C = annual rural cash income in dinars from wages and non-farm self-employment

(cited in Todaro, 1976:49)

The function was estimated using ordinary least-squares regression and probit analysis. The advantages and disadvantages of these estimation procedures have been discussed by several economists (Todaro, 1976; Schultz, 1975 and 1976) but are not our major concern here. Rather, we would like

to emphasize the compatibility of a function of this form with analysis of both fertility and migration decisions and suggest a number of variables common to fertility and migration micro-functions. If, for example, similar micro-functions were estimated on the same data set, using the same independent variables, for two dependent variables, the probability that the decision to migrate will be made and the probability the decision to have an additional child will be made, then the responsiveness or elasticity of the decision outcome to changes in the socio-cultural, economic and household structural factors may be compared and contrasted.

A specific example may serve to illustrate the utility of such an approach.

Consider two dichotomous dependent variables:

- (1) $P(\text{migrate from } i \text{ to } j)$
- (2) $P(\text{have live birth})$

And two micro-functions:

- (1) $P(\text{migrate from } i \rightarrow j) = f(\text{INCOME, ED, COSTS, AGE, DISCREP, INFO, AVAIL})$
- (2) $P(\text{birth of parity } j, \text{ having achieved parity } i) = f(\text{INCOME, ED, COSTS, AGE, DISCREP, INFO, AVAIL})$

where:

DISCREP: is a measure of the discrepancy between the perceived utility in place j minus place i (with respect to migration) and a measure of the discrepancy of the ideal number of children minus present number of children (with respect to fertility).

INFO: is a measure of knowledge of the destination (see discussion of variables included by Hay) with respect to migration, and a measure of knowledge and availability of fertility control measures.

AVAIL: is one of the components of motivation-availability attempting to measure the cognitive and/or physical availability of the option in question. This variable (or group of variables) would incorporate such general factors as cultural norms relating to migration and fertility, as well as whether or not the individual had sufficient resources to make the options meaningful.

Although we will discuss the policy implications of such an approach in the final section of this review, several brief observations may be made here. It is clearly useful to policy makers, for example, to have some indication of the relative elasticity of fertility to education as contrasted with migration. If for example, there is a moderate negative response of fertility to education, and a major positive response of migration to education, then the provision of educational facilities as a policy instrument must be carefully considered.

A few comments relating these micro-functions to the nature of migration decision-making as specified by Burch (as well as the analogous fertility specification) may be useful here. The micro-function listed above suggest that socioeconomic, cultural, and household characteristics of a given individual influence the probability that the individual will decide to migrate or to have an additional child. The discrepancy variable which we included in the micro-function is intended to measure the

motivation to migrate which Burch discusses; that is, the discrepancy between some ideal state and the present state.

In summary, in this section we have attempted to demonstrate the striking similarities between migration and fertility decisions when viewed in the context of household maximization. We have looked at similarities in the nature of the decision-making process (rational utility maximization), the context of the decision (the household), the constraining and facilitating factors (socioeconomic, cultural, and personal characteristics), and the planning horizon. In the final section of this review, we will examine policy alternatives and instruments and relate potential intervention strategies to these four points.

PART V

Policy Intervention Considerations:
The Relationship of Theoretical Models to Planning

A. The Complexity of Policy Intervention

Rural-urban migration and rapid urbanization in the world are determined by the interaction of fundamental socioeconomic, ecological, and biological forces, including rapid population growth and excess labour in rural areas, shortages of land in settled rural communities, soil erosion, ethnic conflict, and, perhaps most importantly, the economies of scale in production and distribution of goods and services associated with the urban way of life. Public policies often have little control over many of these factors and where they do have some impact (say, in areas of trade, industrial investment, and the location of social services) programs are often introduced without any particular regard to their impact on the size and distribution of human settlements, or to the subsequent impact of these variables on the development process itself. It is not surprising, therefore, then when specific policies are implemented that do seek to influence the pattern of human settlements, they are often not effective. The momentum of other government policies and of the broad dynamics of socioeconomic change are far more powerful than the specific policies. (Simmons, 1977:109)

In an excellent review of internal migration in developing countries, Simmons (1977) points out both the complexity of the issues involved and the difficulty of evaluating the impact of various policies. The previous sections of this review should be sufficient to indicate the multitude of factors which interact in very complicated ways to determine individual decision-making, regional migration rates, and the impact of those rates on economic development. Analysis of attempts to alter or intervene in these processes is even more difficult. For example, policies

may be ambiguously stated and not vigorously applied. Or sufficient funds may be lacking to provide the capital investment required for a given policy to be implemented. Nevertheless, some generalizations are possible at this point about the types of policy options and instruments available, and the relative success of policy efforts in various countries. Various options which influence migration and fertility may be best understood in the context of a discussion and comparison of macro- and micro-models. The policy relevance of these two approaches to modeling is discussed. Then policy approaches designed to influence various aspects of migration are reviewed. The success of these approaches is interpreted in the light of Figure 1, with an emphasis on the extent to which they take into account the various motivational components and contexts of individual decision-making

B. The Utility of Macro and Micro-Models for Policy Planning

On balance, therefore, the macro-approach probably has more policy pay-offs than the micro-approach for the simple reason that policy makers would probably rather have information on actual gross flows than on individual propensities. And yet, from the viewpoint of advancing our understanding of who moves and why, the micro-propensity approach is more informative. (Todaro, 1976:51)

While it is true that macro-models provide policy makers with estimates of the impact of certain socioeconomic factors on regional rates, the micro-approach can deal with the determinants of individual perceptions and motivations in decision-making. This sort of consideration is absolutely essential to successful policy intervention. Since

aggregate migration rates are comprised of individuals who have made the decision to migrate, if we want to alter migration rates we must alter the inputs to the decision making process. In the most simple statement of this approach, when perceived benefits exceed perceived costs, an individual will move. To tip the balance of the personal calculation, policy makers can attempt to alter the actual cost-benefit ratio in some way, or they can attempt to influence the perception of that ratio, or they can do both.

Another way of stating this macro-micro contrast is to suggest that regional characteristics affect individuals with different characteristics differently. For example, we have already reviewed several works which identify "more mobile" and "less mobile" migrants (Findley, 1977; Hendershot, 1976). It seems clear that the more mobile migrants; that is, the ones who are better educated, better off economically, and have more information about their destination, are making the migration decision differently than the less mobile migrants. It is also likely that they would be responsive to different types of policy intervention.

As Gaude (1976) points out, "the influence of each of the determinants of migration varies according to how the migrants are differentiated by their personal characteristics, including educational and occupational status prior to migrating." (p.82). This point suggests that individuals with differing characteristics may calculate their costs and benefits differently; they very likely will evaluate the components of motivation (availability, incentive, motive, and expectancy) differently, and their household decision-making context may differ (Herold, 1979). Therefore

in the following section we will review four alternative policy approaches and the instruments used by each.

C. Policy Alternatives, Instruments, and Decision-Making Interpretation

In reviewing policy intervention in the migration process Simmons (1977, 1979) points out that there are basically four policy alternatives:

- (1) to stop the flow of migrants at the source, by attempting to improve the situation in the rural areas in some way;
- (2) to redirect the outmigration from the rural areas to unsettled or frontier areas, by encouraging transmigration, colonization, or the development of new towns;
- (3) to redirect outmigration from the rural areas to urban growth poles, or alternative intermediate size cities;
- (4) to attempt to accommodate migrants in the urban areas, by investing in housing, social services, and aid for the adjustment process (Simmons, 1977:103).

(1) Attempts to Reduce the Flow of Outmigration from the Rural Areas

Assuming that we take a household maximization viewpoint of individual migration decision-making, in order to reduce the outflow of migrants from a rural area, policy efforts must be directed at altering the actual balance of costs and benefits, or at altering the perception,

awareness, or estimation of those costs. In terms of Figure 1, a change in access to resources might alter the motivational components of migration, especially incentive. Land reform has been attempted in many rural areas for various reasons, but there is no clearcut impact on the rate of rural out-migration.

Berke (1970) for example finds evidence that land reform slows down rural-urban migration. Griffin (1973), as well, suggests that it is lack of access to resources which force the rural poor to migrate. If this is true, then increased opportunity for land ownership should improve the economic status of the farmer and reduce the propensity to migrate.

Two measures of access to resources in the rural area are the off-farm wage rate and the return to labor in the agricultural sector. Riddell (1978), Oberai (1977), and Yap (1975) suggest that increased off-farm employment in rural areas, an improvement in the terms of trade between rural and urban areas, and improvements in the rural marketing system may slow out-migration. Griffin (1973), makes similar suggestions.

Numerous other economists have found consistent relationships between measures of the rural economy and the outmigration rate. Renaud (1977) finds a negative relationship between the rural-urban migration rate and the ratio of prices received by farmers to prices paid by farmers. Byerlee, et al. (1976), however, suggest that policies of this type may reduce the out-migration of uneducated migrants slightly, but have minimal impact on the educated migrants.

It goes without saying, however, that policies may have unexpected or undesired effects. For example, rural development schemes frequently aim to provide better educational opportunities to the rural population; however, it has been found repeatedly, on both the aggregate and the individual level, that increases in education stimulate migration (Ridell, 1978; Yap, 1975; Todaro, 1976; Simmons, 1977; Findley, 1978). This is not surprising since education is likely to increase an individual's awareness of urban opportunities, as well as providing skills which typically are more highly rewarded in the urban labor market. Todaro (1976) points out that off-farm employment may even have the long-term unexpected consequence of increasing out-migration if it trains workers in skills which they can then take to the urban areas.

There are numerous other components of rural development programs which may, in the long run, stimulate out-migration. Development of infrastructure, for example, to the extent to which it increases ties and communication with an urban area, may increase awareness and the availability of the migration option. Any development activities which strengthen economic and social linkages between rural and urban areas may act in this way (Todaro, 1976).

In summary, it seems clear that the most predictable ways to reduce the migration rate from a given area, or to reduce the likelihood that a given individual will decide to migrate is to increase the economic return to labor in the rural area, thus tipping the cost-benefit calculation in favor of the place of origin. Other rural development efforts may very likely increase the likelihood of migration by increasing the availability of the option.

(2) Redirection of Migrants to New Areas

A second policy approach is to redirect outmigration from the rural areas to alternative rural or new town locations. This approach to redirection has taken three major forms: 1) the redistribution of rural migrants to other rural areas, 2) the forced redistribution of urban residents to rural and frontier areas, and 3) the redistribution of migrants to new towns and new cities.

Perhaps the best example of the first approach, the redistribution of rural migrants to other rural areas is the transmigration incentive program in Indonesia. Usually this and other rural to rural incentive programs have the potential for only limited success, since the number of migrants that can be accommodated is typically small due to the fixed availability of agricultural land and the high relocation and start-up costs for migrants. Furthermore the economic returns to labor, often a key motive for migration, is also likely to be low in rural areas in comparison to an alternative urban location (De Jong and Fawcett, forthcoming).

The forced redistribution of urban migrants to rural and frontier areas has been employed by the Chinese during the past two decades (Chang, 1979). However, while this approach may have redistributed tens of million Chinese youth to rural communes, the use of food cards, internal labor permits and police force to achieve redistribution goals are not feasible in most other political systems.

The development of new cities and towns represents a third more striking approach to population redistribution. This approach has been employed most notably in Great Britain and Israel where nearly 30 new

cities have been built in each nation since the late 1940's. New towns permit the policy manipulation of industrial development, housing, and quality living environments as key elements in the emergence of population centers (De Jong, 1975, and Sundquist, 1975). The new town approach to population redistribution usually requires incentive schemes or direct control over industrial location decisions as well as individual and family migration decision making. Israel's placement of immigrants in new towns and the government specification of industrial expansion to new towns are examples of such policy mechanisms.

Aside from the obvious political constraints associated with forced migration, the redirection of outmigration to rural, frontier areas or to new towns often involves high infrastructure costs, particularly in new towns construction. Without some pre-existing industrial base, infrastructure, and urban amenities, new colonies simply do not attract population or business investment. Furthermore, the time horizon for new town development is typically very long, not only for physical construction but also in the emergence of a stable, balanced population structure.

Family and friendship ties also are largely absent in new towns or frontier areas. As these ties are a major source of information about and integration into a new area, the absence of such social structure is a significant impediment to locational decision making in new colonies. Migrants who do move to new towns or frontier areas are predominately young people who quickly reflect the frequency and instability of migration decision-making of that age group. The likelihood of a repeat migration

and its consequences for community instability is thus quite high. Furthermore, this is the age group of highest fertility - a fact clearly demonstrated by the imbalanced population pyramids of many new towns.

In sum, the relative lack of success of these population redistribution strategies in non-communist political systems is not surprising when the migration decision is considered in the context of Figure 1. The lack of information about the destination and the absence of urban life amenities in new settlements greatly reduce the probability that an individual or family will choose a new town or frontier area over remaining at home, or migrating to a large city.

(3) Redirection of Migration to Alternative Cities

A similar, but somewhat more realistic approach to migration policy is the attempt to redirect urban migrants to smaller, or intermediate cities. Hansen (1979) in an excellent review of such attempts, finds limited success in developing countries. The main advantage of this approach over the previous one discussed is that basic infrastructure, economic, and social systems are already in existence. The approach involves the assumption that "large city diseconomies, new technologies, improved transportation and communication systems, and changing residential preference patterns with greater emphasis on nonmetropolitan amenities can promote spontaneous population decentralization" (Hansen, 1979:3). Hansen points out that intermediate size cities are large enough to generate significant externalities and not so large as to have significant diseconomies of scale.

The Netherlands among other Western European nations provides an example of the types of policy measures employed in the regional growth centers strategy (De Jong, 1975; Sunquist, 1975). The measures include a number of incentives to business and industry to locate in policy designated centers. These incentives include investment grants for land, new buildings and machinery, infrastructure (roads, harbors, public utility, etc.) improvement projects, and regional differentiation in tax rates. General incentives to enhance individual and family migrant decision making include grant programs for the improvement of community social amenities in regional growth centers, a national informational service on jobs, and a specific population redistribution migration subsidy scheme which provides grants to married unemployed workers to seek employment and move to designated development provinces.

In the experience of The Netherlands, these measures were not enough to significantly affect the redirection of migration. Thus more forceful growth control policies were instituted to dissuade business and industry from locating or expanding in traditionally high in-migration large urban cities in the Western part of the country. These disincentive measures included land use planning controls and a negative investment tax on business and industry construction in large urban cities. A further measure was an active policy to relocate government agency and ministry employees out of the capital city into development area growth center locations. That the disincentive policies were enacted perhaps reflects the difficulty in altering business and industry location decision making criteria. With all these measures and a quite well coordinated population distribution policy framework in the government, the data on migration

patterns in The Netherlands provide little support for the policy goal of attracting migrants from the larger cities to the policy designated growth centers. However, the policy has reduced the net out migration from the provinces to the larger cities (De Jong, 1977).

Although Hansen focuses primarily on Western countries he does discuss the relevance of the approach to developing countries. The opinion of several economists (Salih et al., 1978; Appalraju and Safier, 1976) seems to be that the alternative growth pole approach has either not really been tried or it is too early to tell. Gaile (1973), in a review of seventeen different studies of attempts to implement growth center strategies finds that the overall results are not encouraging. In general, cities have failed, after the initial investment, to pick up a momentum of their own, attracting new businesses and migrants who might have gone to the primate cities.

In summary, Stark (1980) notes that in a serious program of re-directing migration, profit-earners would have to be bought off. "The required 'compensatory measures' might entail a high social cost - for example, heavy subsidization of labor-replacing, capital-intensive machinery - but they need not. Perhaps the most reasonable strategy would be to create an incentive-cum-subsidies system to encourage profit-erners to locate industry where the potential migrants are" (1980:100). In general the main problem seems to be that intermediate growth center cities simply cannot easily overcome the very strong market forces which tend to concentrate economic activity in a few major centers (Hansen, 1976).

(4) Accommodation and Adjustment of Migrants in the Cities:
Interactions with Fertility Decision-Making

Although the fourth policy option, accommodation of migrants in the cities, does not constitute a way of decreasing the volume of flow into urban areas, it is, in a sense, the most realistic. Individuals continue to move to particular urban areas because they anticipate that they will be better off, and, in fact are. (Todaro, 1976; Findley, 1978). Although they may be unemployed for a while, the "waiting-time" is offset by the pay which they receive when they become employed. For these reasons, attempts to provide, to the limit of resources available, accommodation for migrants and support in the adjustment process may be the most realistic strategy.

The way in which this accommodation or adjustment process takes place may be a major factor in future fertility decisions. We have suggested that the magnitude of adjustment (or of fertility response) is influenced by the magnitude of difference between the place of origin and destination, the duration of exposure to the new environment, socio-cultural or economic factors which serve to insulate the migrant from the new environment, and constraints on adaptability (such as age, previous number of births, etc.). These factors should be taken into account in policy intervention aimed at reducing post-migration fertility. For example, it is clear that the potential for fertility reduction is greater for younger than older women. If program funds are limited, it clearly makes sense to focus on that group with the largest potential for reduction.

Secondly, the way in which housing is located or accommodations are provided may influence fertility decision-making.

In terms of Figure 1, the couple who decides whether or not to have an additional child makes that decision within a specific socio-cultural, economic, and household context. If when they move to an urban area they settle in an enclave of individuals from their home region, and these people comprise their primary social group, this couple is in a real sense insulated from many of the modernizing influences (including shifts in attitudes towards children and fertility) typically experienced in the urban environment.

A policy of settling migrants in dispersed sections of the urban area would ensure a greater difference between original environment and destination environment. However, the questions of cultural acceptability and implementation of the policy are major. It is likely for example, that the knowledge of family and friends in a particular neighborhood of the urban area played a major part in the decision to migrate.

A less direct, but perhaps more effective strategy in the long run is to encourage education and labor force participation of female migrants. These, in the microeconomic framework, would have the effect of increasing the relative cost of children by increasing the opportunity cost or value of the female's time. In addition to the economic factors, education and labor force participation tend to affect tastes and preferences as well.

SUMMARY

The concern of many developing countries with rapid rates of urban growth has motivated policies directed at both fertility reduction and redirection of migration streams. Prior to a discussion of policy intervention, however, it is necessary to review what is known empirically about the relationship between fertility and migration, and to relate these findings to a comprehensive theoretical framework.

Following brief introductory comments and a statement of objectives in Part I, we develop a theoretical framework for fertility and mortality decisions (See Figure 1, p. 11) in Part II. Microeconomic theories of fertility (primarily the "new household economics") and microeconomic theories of migration (primarily the human capital approach) are compared and contrasted. On the basis of the similarities observed, we suggest, as Burch (1980) did, that a more general decision-making approach to demographic behavior may yield new insights. In Figure 1 we specify the relationships among the cultural context, the socioeconomic system, the household, and individual decision making. This framework is used to structure the review of empirical studies presented in Part III.

The studies reviewed in Part III generally deal with either regional characteristics or individual characteristics. Rural and urban regional characteristics are seen as inputs to the individual decision-making process. There is overwhelming evidence in the work reviewed that individuals migrate because economic circumstances in the rural areas compare unfavorably with circumstances in the urban areas. Individuals, of course, vary in their position in the rural socioeconomic system, as well as their anticipated status in the urban area. For this reason we

review in detail the demographic, social-structural, education, and economic characteristics of migrants.

In reviewing characteristics of migrants, we find considerable diversity, but that migrants tend to fall into two groups. Findley (1977) suggests that there are more mobile and less mobile migrants. The more mobile migrants tend to have more education, economic resources, and information about their destination, as well as lower fertility. The less mobile migrants tend to be less educated, poorer, have less information about their destinations, and in general higher fertility. It seems clear that different factors are involved in migration and fertility decision for these two groups and also that the impact of migration on the fertility of the two groups is different.

The relationship between migration and fertility may be the result either of systematic selection of migrants or of adaptation of migrants to a new environment. Migrants may have lower fertility than those who stayed behind because they brought low fertility characteristics with them. Or, they may adapt in some way to urban fertility levels, or both selection and adaptation may be occurring.

The combined effect of adaptation and selection is well documented in the literature. In the last section of Part III we review determinants of the fertility response of migrants. In general, those migrants who are exposed to the new urban environment for a large portion of their reproductive period, and who have characteristics which tend to involve

environment (level of education, female labor force participation, residence patterns) show the greatest fertility response. The distinction between adaptation and selection is an important one analytically, as well as in terms of strategies of policy intervention.

In Part IV we review Burch's (1978) specification of a migration decision making function and specify an analogous fertility decision-making function. The context of both of these decisions is the framework presented in Figure 1, which incorporates the interface between individual characteristics, preferences, and motivations on the one hand and regional social-structural, and cultural characteristics on the other.

In Part V we relate previously discussed literature and theoretical issues to fertility reduction and control of the migration stream. Emphasis is placed on the second topic since this has not been as carefully studied. Particular policy approaches which are reviewed include:

- (1) Attempts to reduce the flow of outmigration from rural areas,
- (2) Redirection of migrants to new areas,
- (3) Redirection of migrants to alternative cities,
and
- (4) Accommodation and adjustment of migrants in the cities.

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APPENDIX 1

SUMMARY OF EMPIRICAL WORK RELATING TO FERTILITY AND MIGRATION

1. Determinants of Rural-Urban Migration
2. Migrant Characteristics
3. Estimated Migration Functions

Table 1: Empirical Tests of the Economic Model of Rural - Urban Migration

Independent Variables

- = Negative Correlation

+ = Positive Correlation

ns = Not Significant

o = Not Included

* = Most Explanatory Power

Country/Migrant Type	Rural (origin) Income	Urban (Dest'n) Income or Wages	Rural Unemployment	Urban Unemployment	Distance	Rural Land Ratio	Rural Land Ineq. Distrib.	Rural Wage Emp. Avail.	Urban Dest. Size	Mig. Stock
Crossnational/Aggregate mig.	+ Differential		0	-	0	+	0	0	-	0
Sierra Leone/Educ R-U mig.	-	++	0	+	-	0	0	0	0	0
Sierra Leone/Uneduc. R-U mig.	-	++	0	-	-	0	0	0	+	0
Sierra Leone/R-R mig.	ns	+	0	ns	-*	0	0	0	0	0
India/Interstate mig.	-	+	0	0	-*	0	0	0	+	0
India/Interstate mig.	-	-	0	0	-	0	0	0	+	++
Indonesia/Rural out-mig.	-	0	0	0	0	-*	0	0	0	0
Ghana/Interstate mig.	-	+	0	0	-*	0	0	0	+	0
Puerto Rico/State out-mig.	ns	0	+	ns	0	0	+	-	0	0
Egypt/Interstate mig.	-	+	0	0	-*	0	0	0	+	0
Venezuela/Interstate mig.	+	-	0	0	-	0	0	0	0	++
Venezuela/Young male interstate mig.	-*	+	-	-	-	0	0	0	0	0
Kenya/Male interstate rural-urban mig.	ns	+	0	-	-	0	ns	-	0	++
Kenya/Female interstate rural-urban mig.	ns	+	0	ns	-	0	+	-	0	++
Brazil/Interstate mig.	-	+	0	ns	-*	ns	0	0	0	0
Columbia/Interstate mig.	+	0	0	0	-*	ns	ns	0	0	0
Chile/Rural out-mig.	0	0	0	0	0	+	+	0	0	0
Turkey/Rural out-mig.	-	0	0	0	0	0	0	-	+	0
Mexico/Interstate mig.	ns	+	ns	-	-	+	ns	0	ns	++
Mexico/Male Interstate	+	ns	+	ns	-*	-	ns	0	ns	+
Mexico/Female Interstate	+	ns	+	ns	-*	ns	ns	0	ns	+

Note: Some of the regression equations included other variables not shown in this table, therefore, these are not to be interpreted as the most robust equations - expl. rural-urban migration.

SOURCES

1. Annable, 1972
- 2-4. Byerlee et al., 1976
5. Greenwood, 1971
6. Hay, 1974 (OLS Model)
7. Beals et al., 1967
8. Boswell, n.d.
9. Greenwood, 1969
10. Levy & Wadycki, 1973
11. Levy & Wadycki, 1972
12. Rempel, forthcoming
13. Sahota, 1968
14. Schultz, 1969
15. Shaw, 1974
16. Munro, 1976

TABLE 2: MIGRANT CHARACTERISTICS

Characteristics	More Selective Rural Urban (Innovation)	Less Selective Rural-Metro	Less Selective Rural-Other Urban	Less Selective Rural-Rural
Age	Young (15-25 yrs)	Young (15-30)	Young to Old (15-45)	Older (30+)
Sex of Migrant	Male; Female also in Latin America	Male but wife may join later Single Females for domestic service	Entire family O/wise Male unless Latin America in which case Female	Same as Rural-Other urban less selective
Education	At least primary and probably secondary schooling	Some primary; perhaps some secondary	Some primary	Uneducated
Family Size	Not relevant to decision	Large natal families for single migrants; Small migrant families for married unless only spouse goes	Same as Less-Selective Rural-Metro	Large household size
Family Income	High to moderate	Moderate to low	Moderate to Low	Low
Land Ownership	Large landowners Some medium size farm owners	Medium & Small farm owners	Small farmers or landless	Mostly landless
Occupation/Skills	Tend to have little employment experience	Some with non-agric. skills	Mainly agric/unskilled. Some with job training or exper.	Agric/Unskilled
Urban Contacts and Awareness	High urban awareness via educ. & media	Metro contacts and kin important	Other urban contacts and kin important	Kin in rural areas determine destn. Low urban awareness
Modern Attitudes	Aspiring seeker, Risk taker	Willing to take some risks, but much less	Same as Rural-Metro	Limited ability to take risks
Family Old Age Support	If children do provide, selective migrants do provide support	Dependent on children in city	Dependent on children in city	Children in rural areas take care of parents
Ethnic Variables	Less inhib. by need for proximity of same language	Matrifocal resid. facil. dual household	Need to be near kin or language constantly may restrict movement. Only close to cities	Move to areas of cultural similarity or same region
Importance of Distance to Destination	Little	Moderately Important	Important	Important

(Findley, 1978: 35)

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TABLE 3: ESTIMATED MIGRATION FUNCTIONS

Country	Type ²	Specification ³	Statistical unit ⁴	Principal determinant ⁵	Secondary determinant ⁵	R ² ⁶	Df ⁶	Sources
India (1966 survey)	r.u.	LL	Rate	Men: income differential Women: proportion of skilled urban jobs	Distance	0.78	293	Hempel (1), p. 109
India (1968 survey)	r.u.	LL	Men aged 15 to 50 already resident in town for 4 or more years. Flow	Urban income	Rural income	0.61	32	Huntington (1974)
India (1969 census)	c.s.	L	Proportion of population emigrating between 1965 and 1969. Rate	Index of rural income	Education	0.30	22	Bates (1974), p. 549
West Nigeria (1971-72 survey)	r.u.	LL	Proportion of migrants in each family. Rate	Average age of rural family	Education	0.80	475	Eosang (1974), p. 17
Uganda (1960 census)	c.s.	LL	Men aged 15 to 54. Rate	(a) Men aged 15 to 54: income (b) Men aged 15 to 24: idem (c) Women aged 15 to 54: idem	Distance Idem Idem	0.91	32	Beals (1967), pp. 434 ff.
Tanzania (1971 survey)	r.u.	L	Men born in the country who came to town after age of 13. Rate	Index of probability of finding an urban job Index of urban income	Average urban population	0.55	102	Barnum and Sacco (quoted by Yap, 1975), p. 60
Morocco ^a (1960-1970 census)	r.u.	L	Rate of net migration in a region i	Proportion of active population receiving a non-agricultural income	Irrigation	0.75	12	Mertaugh (1970), table 3.2, p. 89
Egypt (1960 census)	r.u.	LL	Men born in i and recorded at j in 1960. Flow	Size of origin population	Distance	0.75	170	Greenwood (1966), p. 186

¹ It is a pity that the authors do not publish the partial results of the regressions: by entering the variables one after the other one is better informed about the degree of explanation of each one of them according to the order in which they are chosen to appear in the regression. In addition, one obtains valuable indications about possible multi-collinearity.

² Type of sample: c.s.: cross-section analysis of states or provinces; r.u.: rural-urban migration.

³ Specification of the migration functions: LL: Log Linear; L: Linear (since the dimension of the parameters is not independent of the units of measurement of the explanatory variables, in this case I shall only give the two most significant variables).

⁴ Flow: net volume of migration between two regions over one period; rate: flow divided by the population of the origin region; speed: rate divided by the population of the destination region.

⁵ Principal determinant: maximum value of the significant parameter in absolute value; secondary determinant: the next significant parameter. If two (or more) parameters have the same degree of significance, I have taken the one which is highest and has the expected sign.

⁶ R²: coefficient of determination; Df: degrees of freedom (number of observations less the number of parameters to be estimated).

^a Hortaugh (1970) used the same type of dependent variable as Schultz (1961) for India and Bates (1974) for Egypt. The migration rate used does not differentiate between migrants' sex, in and destination region, but between flows of net migration towards (+) or from (-) a region over one period in relation to the population of that region calculated at the middle of this period. See Hortaugh (op. cit., p. 70 ff.) for further details.

TABLE 3 (continued)

Country	Type ^a	Specification ^b	Statistical unit ^c	Principal determinant ^d	Secondary determinant ^e	R ² ^f	D ^g	Source
Venezuela (1961 census)	c.s.	LL	Men who have been resident in town for less than one year. Flow	(a) age 15-24: urban education (b) Age 25-54: distance	Distance	0.61 0.60	368 368	Levy and Warynski (1972)
Venezuela ^b	c.s.	LL	Males aged 7 and over as a proportion of the equivalent origin population. Rate	(a) No education. Degree of urbanisation in the destination region (b) Primary education. Idem (c) Secondary education. Income in the destination region	Distance	0.79 0.85 0.87	366 368 368	Levy and Warynski (1974), p. 383
Mexico (1960 census)	c.s.	LL	Rate	Distance	Relative illiteracy	0.30	-	Ovedovitz (1974), p. 68
Brazil ^c (1950 census)	c.s.	LL	Flow	Age 15-29: income growth rate in the origin region Age 30-59: idem	Distance	0.52	327	Sahota (1968), pp. 230 ff.
Colombia (1951-1964 census)	c.s.	L	Net migration rate in one region	Low rural income (especially amongst the young)	Idem	0.571	327	Schultz (1971)
Jamaica ^d (1960 census)	c.s.	LL	Rate	Distance	Population pressure and insecurity	0.52	-	Ovedovitz (1974), p. 68
Jamaican Republic (1960 census)	r.u. and c.s.	L	Wage- or salary-earning household heads recorded as emigrants living in urban or rural group in any province. Rate	urban in-migration regional wage differential rural out-migration poor explanation	unemployment rate	.726	20	Carjaval and Geithman (1976)
Costa Rica (1963 census)	c.s.	L	Census household heads classified as employees and recorded as in-migrants in any city or town in any Canton. Rate	regional wage differential	Average education	.527	20	Carjaval and Geithman (1974)
India (1961 census)	c.s.	LL	Men who have been resident in town for less than one year. Flow	Distance	Origin population	0.70	231	Greenwood (1971)
Philippines (1965 census)	r.u.	LL	Rate	Men: distance (local migration) Women: idem	Average income in origin region Idem	0.78 0.70	89 89	Wéry (1974) p. 1
Indonesia (micro sample, 1971)	r.u.	LL	Rate	Rural unemployment	Education and age	0.74	1737	Temple (1973), p. 188
Rep. of Korea (1955-1972 census)	r.u.	L	Rate	Terms of trade	Capital formation	0.21	11	Park (1975), table 4, p. 11 and 12
Urbanisation in 25 developing countries	r.u.	L	Differences between the urban rate of growth and the demographic rate of growth	Proxy for the size of the urban informal sector	rural-urban income differentials	.42	25	Annabie (1974), p. 400, equation 1

^b The rate of unemployment in the origin region has the same intensity whatever the level of education, as does the rate of urbanisation in the destination region (op. cit., p. 371). Other results: the migrants' mobility tends to increase with education due to better access to information. Similarly, educated migrants seek out regions with larger and diversified labour markets. See also Schultz (1975) who, using a different specification, on the whole confirms these results.

^c Cf. also Ovedovitz (1974, p. 69) who, with a number of different explanatory variables, adds to the distance factor the degree of relative illiteracy, a result which also agrees with those established by Sahota, op. cit., p. 230.

^d These results are confirmed in the main by Adams (1969).

^e The migration equation was also calculated for the year 1960 and the results are similar to those for 1965.

^f Here we are dealing with a time series over 17 years. The model is one of the few to use simultaneous equations.

APPENDIX 2

FACTORS AFFECTING FERTILITY VARIABLES

FACTORS AFFECTING FERTILITY VARIABLES

Fertility Variables	Place Factors	Person Factors
Age at marriage or first birth	Roles of young women in family Educational or economic opportunities	Patrilineal inheritance Status of young woman Non-marriage options
Fecundity	Prevalence of venereal diseases General sanitation and health levels Maternal and child health care	Own nutrition and health status
Exposure to intercourse	Community's sexual customs General concern for replacement	Own infant and child mortality Knowledge of reproductive process Type of marriage Breastfeeding duration
Decision to limit births	Social or cultural importance of children Child costs-benefits Examples of small families Range of economic opportunities for women General educational level and costs Access to long-term investment capital Access to consumer goods Maternal and child health care Community attitude to innovation and change	Own educational attainment Own awareness of reproductive process and FP methods Approval of non-motherhood roles Consumer good preference Own employment experience and options Own aspirations Importance of own children to reducing risks Own health level and childbearing experience
Ability to limit births or family size	Access to acceptable, low-cost FP methods and counseling Access to abortions	Family influence on child decisions Husband-Wife egalitarian, decision-making Normative support for decision

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APPENDIX 3

POTENTIAL POLICY IMPACTS ON THE MIGRATION DECISION

POTENTIAL MIGRATION POLICY IMPACTS

Policy options	Implementation problems	Evaluation of impacts
<u>Migration Goal: Slow Rural Outmigration</u>		
<p>Employment and income policies. Create more jobs at higher income levels in rural areas. May include production technology changes, land reform, rural public works projects, industrial decentralization, price supports, etc.</p>	<p>Can be implemented piecemeal, but solution may require long-term support programs or structural change. Employment programs can be supplemented by programs to upgrade skill levels and innovative abilities. Long-range reduction of population growth may be necessary to bring jobs and resident population into equilibrium.</p>	<p>Some examples show higher incomes and less underemployment associated with public works; industrial decentralization may have mixed results because it is often capital-intensive. Credit and improved methods are important to income gains, but price supports may be a critical incentive to change. Land reform may not guarantee permanent income redistribution.</p>
<p>Integrated rural development. Often follows land reform to provide small farmers with new support system. Includes comprehensive provision of new technology, credit, inputs, marketing, and social services.</p>	<p>Costly in terms of political supports, administrative resources, and funding. Coordination is important, as well as real profit potential for small farmers. Generally for implementation in selected areas only.</p>	<p>Improves small farm income if well innovated and coordinated. Employment changes are secondary. Probably slows outmigration, but this is yet not evaluated. May create greater regional inequity between areas with and without programs.</p>
<p>Dispersed urbanization. Includes creation of market towns to facilitate commercialization of agriculture. Non-agricultural employment also important to strategy.</p>	<p>Coordination and selection are important. Contrast between top-down and bottom-up development of market towns. Linkages between farmers and villages are critical. Heavy infrastructure components may be necessary.</p>	<p>Adopted in only a few nations or regions but results are encouraging for slowing outmigration. Migrants go to nearby towns, rather than out of region. Can be costly but is reduced by self-help. Bottom-up efforts may prove less costly and more viable.</p>
<u>Migration Goal: Redirect Rural Outmigration</u>		
<p>Rural settlement or colonization projects.</p>	<p>Often involves costly construction of highway access, reservoirs, irrigation systems, etc. Inclusion of educational and social programs is critical. Migrant selection and assistance are major problems.</p>	<p>Settlement and colonization schemes open up new land, but are very costly, and they do not guarantee successful settlement. Least spontaneous colonization, with penetration or feeder roads. On balance, projects reach a minority of rural poor, given the large investments.</p>

MIGRATION POLICY IMPACTS (continued)

Policy options	Implementation problems	Evaluation of Impacts
<p><u>Migration Goal: Channel Urban Migrants to Selected Destinations</u></p> <p>Development of growth poles at intermediate-size cities. Often based on industrial development but may also exploit region's resources. Can be mixed with regional and dispersed-urbanization strategies.</p> <p>Regional development efforts. To create a balanced urban hierarchy with wide range of urban destinations available.</p>	<p>Selection of centers is difficult because there is no good definition of how to make a successful center. Political decentralization may be necessary for regional autonomy. It is important to link center-hinterland development. Control of city's development may be difficult.</p> <p>Identifying regional problems and goals is important to agreement on regional development. Upgrading human resources is essential to the strategy's long-range employment and income goals. Marketing and industrial decentralization programs may be included. Implementation of plans is difficult because of long-range commitments and massiveness of investment.</p>	<p>Industries may not be labor-intensive and may not generate "spread" effect or growth in rest of region. Problems with unbalanced development may only accelerate. Migrants may be attracted, but there may not be adequate provision for absorbing poor, less mobile migrants. Some strategies work, but these depend on strong center-hinterland linkages prior to initiation of the program.</p> <p>Problems of increased inequity may result if efforts to develop precede structural change, e.g., land reform or income redistribution. Agriculture may be slighted. Difficult to evaluate development program's direct relation to migration change, but if development goals met, migration out of region may slow.</p>
<p><u>Migration Goal: Encourage Migration to Major Metropolises</u></p> <p>Capital-intensive development of agriculture. Includes adoption of new technologies raising labor productivity and requiring fewer laborers. A whole package of inputs is involved.</p> <p>Industrial development of cities. Goal is to reduce dependence on foreign imports and to increase access to goods, thereby raising level of living.</p>	<p>Requires capital which can be subsidized. The package of inputs may not work unless the entire package is adopted. Often shuts out small farmers who have limited credit.</p> <p>Focuses on most advanced cities, accentuating and supplementing their advantages and economies of scale. Requires much capital, which may be subsidized. Immigration is desired to keep wages low.</p>	<p>Tends to make rich richer and poor poorer. Creates a labor surplus. Wages may fall as labor becomes less in demand. May become a major cause for rural outmigration.</p> <p>Cities grow as migrants are attracted to jobs. More industrialized goods are available to nation, but may reach only urban population. Migrants have gone to seek industrialized jobs, but job creation has not kept pace with migration. Creation of a dual economy with marginal subsistence and modern industrial sectors.</p>

MIGRATION POLICY IMPACTS (continued)

Table 11. POTENTIAL MIGRATION POLICY IMPACTS (Cont.)

Policy options	Implementation problems	Evaluation of impacts
<u>Migration Goal: Cope with Urban Inmigrants</u>		
Provide more jobs for migrants, especially in the small-scale sector.	Expansion of small-scale, labor-intensive sector is necessary, and this requires special credit, training, and marketing programs.	Involves programs with promise of absorbing migrants, but has been little tried or evaluated.
Rationalize housing and land use patterns. May include sites and services, public housing, planning and zoning, establishment of industrial estates, and construction of new towns or satellite cities.	Location of infrastructure is key to guiding growth. Rationalizing land use is difficult. New towns are very costly and offer no guarantee of permanent resettlement. Self-help and attention to neighborhood needs are important.	Most effective tool is site and services, but industrial estates have also had some success. Public housing and new towns usually are too costly and poorly designed relevant to the needs of the poor.
Extension of social services, including education, health, and welfare.	Different neighborhoods have different needs. Major problem is who pays for services. Self-help is often used to build facilities, but operation and maintenance are problems. Attention to community factors (social, cultural, political), may be critical to extending services.	Self-help efforts have had substantial impact on reducing service gap because migrants are often responsible for helping themselves. Major problem continues to be inadequate financing and management.
<u>Migration Goal: Restrict Migration to Metropolitan Areas</u>		
Adopt metropolitan permit system.	Major problem is monitoring population flow. Requires strong political control.	May reduce migration slightly, but at great political and administrative cost. May increase corruption and negative attitude toward government. May harm natives and migrants by making life harder for all.

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