FCNDP No. 186

FCND DISCUSSION PAPER NO. 186

# ARE WEALTH TRANSFERS BIASED AGAINST GIRLS? GENDER DIFFERENCES IN LAND INHERITANCE AND SCHOOLING INVESTMENT IN GHANA'S WESTERN REGION

**Agnes R. Quisumbing, Ellen M. Payongayong, and Keijiro Otsuka**

**Food Consumption and Nutrition Division**

**International Food Policy Research Institute**
**2033 K Street, N.W.**
**Washington, D.C. 20006 U.S.A.**
**(202) 862–5600**
**Fax: (202) 467–4439**

**August 2004**

## Abstract

This study attempts to analyze changing patterns of land transfers and schooling investments by gender over three generations in customary land areas of Ghana's Western Region. Although traditional matrilineal inheritance rules deny landownership rights to women, women have increasingly acquired land through gifts and other means, thereby reducing the gender gap in landownership. The gender gap in schooling has also declined significantly, though it persists. We attribute such changes to the increase in women's bargaining power due to an agricultural technology that increased the demand for women's labor, contributing to the reduction of "social" discrimination as well as weak "parental" discrimination.

## Contents

Acknowledgments ..... v

1. Introduction ..... 1

2. Conceptual Framework ..... 3

    A Theory of Intergenerational Transfers ..... 3
    Empirical Specification ..... 6

3. Inheritance and Schooling in Ghana's Western Region ..... 9

    Study Sites and Sample Description ..... 9
    Determinants of Wealth Transfers in the Respondent Generation ..... 15
    Determinants of Schooling and Proposed Land Transfers in the Child Generation ..... 19
    Changing Patterns of Gender Discrimination ..... 24

4. Conclusions ..... 25

References ..... 28

## Tables

1 Demographic characteristics of sample individuals, by ethnic group of individual, Ghana ..... 12

2 Land owned, by ethnic group of individual, in hectares ..... 13

3 Average size of land per person (in hectares) received from family by respondent and siblings in the form of inheritance, allocation, or gift, by ethnic group of head (includes only those currently living or deceased but were age 21 or over at time of death) ..... 14

4 Mean size of land (hectares) to be bestowed to children 7 years old or older, by ethnic group of parent (includes only children from intact households) ..... 15

5 Determinants of schooling, land inheritance, and family land allocation, respondent and siblings, tobit estimates ..... 16

6 Determinants of land inheritance, gifts, and schooling, respondent and siblings, fixed-effects tobit estimates ..... 20

7 Determinants of expected land transfers and schooling, respondent's children, tobit estimates ..... 21

8 Determinants of expected land transfers and schooling, respondent's children, fixed-effects tobit estimates ..... 23

9 Tests for gender discrimination, respondent and child generation ..... 24

## Acknowledgments

This research was supported by the Government of Japan, the United Kingdom's Department for International Development, and the U.S. Agency for International Development, Office of Women in Development, Grant No. FAO-0100-G-005020-00, on "Strengthening Development Policy through Gender Analysis: An Integrated Multicountry Research Program." This paper is the basis of Chapter 9 in *Land and Schooling: Transferring Wealth Across Generations* (2004) by A. R. Quisumbing, J. P. Estudillo, and K. Otsuka. We thank an anonymous reviewer for helpful comments and suggestions.

Agnes R. Quisumbing and Ellen M. Payongayong
International Food Policy Research Institute

Keijiro Otsuka
Foundation for the Advanced Studies on International Development and
International Food Policy Research Institute

**Key words**: wealth transfers, gender, Ghana

## 1. Introduction

There is growing concern about the erosion of women's land rights in customary land areas, particularly in Sub-Saharan Africa. A number of recent studies report that rising population pressure and increasing profitability of investment in land improvement, including commercial tree planting, have stimulated the evolution of customary land tenure institutions from communal ownership toward individualized ownership (Otsuka et al. 2001; Place and Otsuka 2000, 2001a, 2001b; Quisumbing et al. 2001). According to a recent literature review by Gray and Kevane (1999), increasing commercialization, population growth, and concurrent increases in land value seem to have adversely affected women's land rights in Africa. It has been also argued that a shift in land tenure toward individualized rights has eroded women's land rights (Lastarria-Cornhiel 1997). This argument is often supported by noting the gradual disappearance of matrilineal inheritance and its replacement with patrilineal inheritance systems, e.g., in some parts of South Asia (Agarwal 1994) and Sub-Saharan Africa (Place and Otsuka 2001a, 2001b).

However, empirical evidence supporting such popular arguments is generally scanty. Moreover, whether changes in land inheritance patterns favoring men necessarily lead to a deterioration in women's welfare cannot be ascertained without considering other important forms of intergenerational wealth transfers. For example, in economies with rapidly expanding nonfarm employment opportunities and low or stagnating returns to agriculture, education may be a more valuable form of wealth transfer to one's children than agricultural land. In fact, recent studies in the Philippines by Estudillo, Quisumbing, and Otsuka (2001a, 2001b) found that daughters inherit less land but receive more schooling than sons, which leads to rough parity in total lifetime income.

This study attempts to explore evolutionary changes in education and land inheritance patterns over three successive generations in Ghana's Western Region.[1] Traditionally, Akan households in this region have practiced uterine inheritance, in which

[1] This study is the basis for Chapter 9 in Quisumbing, Estudillo, and Otsuka (2004).

land is transferred from the deceased man to his uterine brother or nephew (sister's son) in accordance with the decision of the extended family or matriclan.[2] In this system, children do not inherit land from their parents, particularly their fathers, but sons may inherit land from their matrilineal relatives. In contrast, among patrilineal groups that have migrated to the area, inheritance occurs strictly along paternal lines. Recently, however, Akan land is often transferred from husband to wife and children as inter-vivos gifts—if the wife and children help the husband establish cocoa fields (Quisumbing et al. 2001). The increase in the demand for women's labor due to the expansion of labor-intensive cocoa cultivation seems to have created incentives for husbands to give their wives and children land. In this study, we expected that investments in the education of sons and daughters would adjust to changes in land inheritance practices, insofar as land transfers and education are major alternative forms of intergenerational wealth transfers.

Using a specially designed retrospective household survey of land inheritance, gifts, temporary allocation of family land, and schooling over three generations, this paper explores statistically the determinants of the bestowal of land and investment in schooling between sons and daughters during the shift from communal to individualized tenure institutions. We pay particular attention to different types of land transfers, since the strength of individual land rights is linked closely to the mode of land transfers: gift transfers have the strongest individual rights and allocated family land the weakest. We also pay special attention to "social" discrimination (associated with traditional inheritance practices and land allocation rules among ethnic groups) and "parental" discrimination (expressed in differential treatment of daughters and sons associated with parental resource ownership). We find that while daughters receive less land than sons, the bias against daughters in land transfers has weakened among Akans due to declining social discrimination. This has occurred partly because of the adoption of an agricultural technology (cocoa farming) that increased demand for female labor and hence of

[2] The preferred order of inheritance if a man dies intestate is first, his uterine brother; second, if there is no uterine brother, the son of a uterine sister; third, one of the sons of the deceased mother's sister (Awusabo-Asare 1990).

women's economic value and bargaining power. Individualization of tenure was, in part, a means of providing an incentive to invest in land, particularly by women. Another important finding is that although daughters continue to be disadvantaged in schooling attainment, there are signs that the gender gap is beginning to close for the younger generation.

## 2. Conceptual Framework

### A Theory of Intergenerational Transfers[3]

In the wealth model of transfers, parents are often assumed to be altruistic (Becker 1974; Becker and Tomes 1986) and care about their children's future income as well as their own consumption. Parents collectively maximize a utility function spanning generations, in which utility depends on consumption of parents ($C$) and the expected future incomes of the daughter ($Y_d$) and son ($Y_s$), which enter separately into the utility function ($U_p$):

$$U_p = U_p\,(C,\, Y_d,\, Y_s)\ . \tag{1}$$

In this study, we assume that some forms of wealth are transmitted intergenerationally by parents, while others are inherited from clan relatives, usually matrikin. We also assume that parents have one daughter and one son. In a more general model, the number of children would be a choice variable.

An income-generating function for the $i$-th child is defined as

$$Y_i = F\,(E_i, f_i, g_i) + G\,(E_i, A_i, g_i) + u_i\ , \qquad i = d, s\ , \tag{2}$$

where $F$ and $G$ are production functions of food crops and cocoa, respectively; $f_i$ and $A_i$ are allocated land for temporary food crop cultivation and gift or inherited land for agroforestry or cocoa cultivation, respectively; $E_i$ is the education level represented by

[3] This discussion draws partly on Quisumbing (1994).

schooling; $g_i$ is the gender of the child; $i$ indexes the daughter and son; and $u_i$ is a stochastic component with mean zero and variance $\sigma_i^2$. In this specification, child's income is the sum of incomes from food crop and cocoa farming.[4]

In Ghana, land allocation for food crop farming is usually made by the extended family, while cocoa land is transferred as gifts by parents. We associate allocated land with food crop production, because land rights on allocated land are weak, and use rights are preserved only if the land is farmed continuously. In contrast, land with stronger rights is associated with permanent crops, although the direction of causation is not merely from stronger land rights to more permanent investment in land (Besley 1995). Tree planting may, in fact, be undertaken precisely to strengthen land rights (Quisumbing et al. 2001).[5]

The income constraint for parents is

$$Y_p = C + p_E \Sigma E_i + p_A \Sigma A_i \,, \tag{3}$$

where the income of parents $Y_p$ is spent on parental consumption of goods $C$ (the numeraire), and expenditures on education ($p_e \Sigma E_i$) and asset transfers ($p_A \Sigma A_i$), in which the price of education is $p_e$ and the price of the cocoa area is $p_A$. It is assumed that unit cost of a transfer is the same for each child. In most altruistic models, a parent maximizes (1) subject to (2) and (3) to obtain the optimal investments in human capital and asset transfers to the daughter and son.

In equation (3), it is assumed that parents are not concerned with the price of food crop area since its allocation is the purview of the extended family. In practice, a young farmer may clear forestland to establish a farm or request an allocation of land from the extended family. In either case, permission beyond one's own parents is needed—from the village chief in the case of forest clearance, or the extended family for the use of family land (Quisumbing et al. 2001). If the daughter were particularly efficient in

[4] For simplicity, we do not consider other farm and nonfarm income.

[5] In an expanded model, the effort of wives and children to establish cocoa farms, which promotes conversion of food cropland and confers strong individual rights, should be taken into account.

generating income from food crops, the extended family could allocate land for food crops to her but decide not to give her cocoa land. Conversely, if the son has a comparative advantage in agroforestry or cocoa growing (due to the requirement of greater physical strength to clear forest and bushland), the extended family might not allocate a large food crop area to him but bequeath more cocoa land to him. Actual land transfers to the daughter and son from parents would then be unequal, depending on their comparative advantages and prior allocations from the extended family.

Suppose now that the relative prices of land and education change. Even if the comparative advantage of each child remained the same, such changes will result in a new utility-maximizing equilibrium, leading parents to change the equilibrium allocation of the two types of land and education. Alternatively, if new technologies or crops are introduced, the comparative advantage of each child in generating income from different types of land or education would change. For example, if the introduction of cocoa increases the demand for female labor, parents may reallocate land to daughters, even if they do not traditionally inherit land.

As formulated above, the total amount of land transferred to children would result from decisions made by the extended family and parents. However, it is empirically difficult to analyze the determinants of land allocated by an extended family that may be composed of over 50 members. Thus this paper focuses primarily on parental wealth transfers.

Conditional on transfers by the extended family, parents may have different objectives that motivate transfers to children. Decisions may be based on future returns that the children would bring to them (Rosenzweig 1986), preferences for intersibling equality (Behrman, Pollak, and Taubman 1982), or trade-offs between equity and efficiency (Pitt, Rosenzweig, and Hassan 1990). The parental allocation rules may be modified by disagreement between parents or by nonaltruistic transfer motives. If parents disagree, or if they do not pool their incomes, the common preference model with a single parental utility function specified above does not hold, and the outcome of the allocation is the result of bargaining between parents (e.g., McElroy 1990). Like other

household allocation outcomes (see Thomas 1990, 1994), intergenerational transfers may reflect individual preferences of husband and wife in decisionmaking, and thus the differential bargaining power of parents may influence the allocation of land and education to children. A collective model of the household that does not assume that parents share the same preferences may be especially relevant to Ghana, where husbands and wives do not pool their resources and maintain "separate purses" (Doss 1996).

## Empirical Specification

Suppose that parents contemplate transfer of different types of land and investment in human capital (or education, represented by schooling) to their children. To investigate the determinants of schooling and land transfers among sons and daughters, we estimate the following transfer equation:

$$T^*_{ij} = \beta_0 + \beta_1 D + \beta_2 X_{cij} + \beta_3 X_{fj} + \beta_4 X_{mj} + \gamma_1 DX_{fj} + \gamma_2 DX_{mj} + \varepsilon_{ij}\ , \qquad (4)$$

where $T^*_{ij}$ is a vector of transfers

$$T^*_{ij} = [E^*_{ij}, I^*_{ij}, G^*_{ij}, A^*_{ij}],$$

and $E^*_{ij}$, $I^*_{ij}$, $G^*_{ij}$, and $A^*_{ij}$ are levels of schooling and areas of inherited, gift, and allocated land received by child $i$ in family $j$. Regression parameters $\beta_k$ and $\gamma_m$ are vectors of coefficients for each type of transfer; $D$ is the daughter dummy; $\mathbf{X_c}$ is a vector of child-specific characteristics such as birth year, number of brothers, number of sisters, a dummy for a half-sibling, and dummies for the eldest child; $\mathbf{X_f}$ and $\mathbf{X_m}$ are vectors of exogenous human and physical wealth of father and mother at the time of marriage (years of schooling and land), respectively; $DX_{fj}$ and $DX_{mj}$ are interaction terms between the daughter dummy and father's and mother's exogenous human and physical capital; and $\varepsilon_{ij}$ is the error term in each equation.

We distinguish among inherited, gift, and temporarily allocated family land, partly because individual land rights for each type differ substantially, and partly because

the influence of parents on each type of land transfer is likely to be different. Allocated land is usually fallow land controlled by the extended family, whereas inherited land was obtained from a deceased family member. Thus, how much land is transferred is determined primarily by the decision of the extended family in accordance with traditional rules of land inheritance and allocation. Such traditional rules have been circumvented by gifts from living donors to reward the efforts of wife and children to establish cocoa fields. Gift transfers are also made among extended family members, and extended family members (who have shared interests in the same piece of land) need to approve gift transfers. Once the wife or children receive the gift land, however, they can bequeath it to heirs of their choice. Thus, if there is any "social" discrimination against female children by the extended family, we would expect to observe that daughters receive less family land that is not directly correlated with land owned by their father and mother. This implies that the daughter dummy would have negative coefficients in the land transfer regressions. By planting trees, parents can transfer their cultivated land directly to their children at will. Therefore, if there is any parental discrimination against female children, we would expect to observe that interaction terms between parental landownership and the daughter dummy would have negative coefficients. We are also interested in the significance of the total effect—the sum of the social and parental discrimination effects against female children.

In the case of schooling investments, it is not the extended family but parents who are decisionmakers. Thus, the concept of social discrimination applied to land transfers is not relevant. Yet, if returns to schooling are lower for women than for men due to societal discrimination in farm and nonfarm jobs, this effect will be captured by the daughter dummy. Parental discrimination associated with resource ownership will be captured by the interaction terms between the daughter dummy and landownership or schooling, to the extent that land and schooling accurately reflect the physical and human wealth of parents.

To account for the possibility that husband and wife do not have identical preferences regarding bestowals to children, an empirical specification consistent with a

collective model of the household is used.[6] Thus, father's and mother's wealth at the time of marriage, which are exogenous to decisions made within marriage, enter separately into the regressions. Parental wealth consists of human capital, as proxied by years of schooling, and each parent's holdings of land at the time of marriage. Most land held at the time of marriage is either recently cleared forestland or food cropland allocated by the extended family. We do not distinguish between each type of parental land in this analysis. If the coefficients of the same physical or human capital variables for father and mother differ significantly, the unitary model of household decisionmaking is rejected.

We also include the number of brothers and sisters in the regression to test whether sibling rivalry affects the allocation of land and schooling to children (Butcher and Case 1994; Garg and Morduch 1998a, 1998b; Morduch 2000). Like parental land assets, schooling is interacted with the daughter dummy to test whether parents with more human capital treat children of different sexes differentially.[7] If the interaction terms with parental characteristics differ significantly, the unitary model is also rejected.

A final test of the unitary model involves comparing the sum of the coefficient on the parental wealth variable and the coefficient of its relevant interaction term with child gender with the corresponding sum for the opposite-sex parent. This comparison captures the total effect of the parental characteristic—not the partial effect achieved by simply comparing the coefficients on the wealth variables. If the sums are significantly different, this is inconsistent with the unitary model.

Equation (4) is estimated both in levels and with family fixed effects. Since land transfers are subject to censoring (many children do not receive any land), a tobit procedure is used for the land regressions in levels. However, it is possible that omitted

---

[6] For a review of collective models of the household, see Haddad, Hoddinott, and Alderman (1997). This formulation draws from McElroy's (1990) specification of the Nash bargaining model and is similar to Thomas (1990, 1994).

[7] For example, Thomas (1990, 1994) finds that maternal education and nonlabor income have a bigger impact on the height of a daughter, relative to a son, and that paternal education has a bigger impact on a son, relative to a daughter.

family-level variables, such as the total land area controlled by the extended family, are correlated with regressors, and thus their estimated effects on transfers may be biased. For those families with at least two children, the within-family allocation can be used as the source of variation in the sample from which to estimate intrahousehold differences in transfers.[8] A fixed-effects estimation procedure could control for these unobservables using family-specific dummy variables.[9] In this specific application, however, only the child's sex, year of birth, half-sibling and eldest dummies, interaction between child sex and ethnic group, and interaction between child sex and parent characteristics remain as explanatory variables. That is, the effects of variables that do not vary across children cannot be identified. Because tobit is inconsistent in the presence of fixed effects, we use the Honoré (1992) least-absolute deviations tobit estimator, which is both consistent and asymptotically normal under suitable regularity conditions and assumes neither a particular parametric form nor homoskedasticity.

## 3. Inheritance and Schooling in Ghana's Western Region

### Study Sites and Sample Description

We conducted a survey of households in 1996–97 in 10 selected villages in the Wassa area of Ghana's Western Region. Although Wassa is the last frontier of westward movement of the cocoa area in this country as migrants moved in search of cultivable forestland (Hill 1963), with the exception of reserve areas, virgin forests have already disappeared in our study sites. After conducting a census of 1,878 households in the 10 villages, we chose 281 households, based on stratified random sampling of pure owners, pure tenants, pure caretakers (who manage mature cocoa fields, usually for absentee owners), owners cum tenants, owners cum caretakers, and tenants cum caretakers

[8] Families with at least two children are included so that birth order and sex dummies are relevant in the family fixed-effects specification. The fixed-effects procedure eliminates selectivity bias since family size, which affects selection into the sample, is a family-specific variable (Pitt and Rosenzweig 1990).

[9] That is, the observed transfer, $T_{ij}$, to child $i$ in family $j$ would be given by $T_{ij} = t_j + \beta X_{ij} + u_{ij}$, where the family-specific effect is a dummy variable, $t_j$, which is taken to be constant for a family (Hsiao 1986).

households.[10] Sample sizes were allocated to the 10 villages in proportion to village population.

For each sample household, we collected information on land tenure status and land use of all parcels, which are defined as contiguous areas of land acquired at the same time through a single mode of acquisition. To investigate whether broad changes in land tenure patterns in the process of individualization have affected the distribution of land rights by gender, a retrospective survey of inheritance and schooling was administered to all households. The retrospective survey on inheritance was patterned after similar surveys in the Philippines (Quisumbing 1994; Estudillo, Quisumbing, and Otsuka 2001a, 2001b) and Sumatra (Quisumbing and Otsuka 2001), and included questions on the parents, siblings, and children of the respondents, yielding information on three generations called the parents', respondents', and children's generations.[11] The respondents were asked about premarriage wealth (schooling and landownership) of their parents and in-laws (and other familial sources of inheritance), the schooling and inheritance of their spouses, and schooling and proposed bequests to their children. Each respondent was also asked to list all of his or her siblings, their dates of birth, their educational attainment, and the areas of different types of land that they received or expected to receive from their parents or other relatives. In many cases, respondents received land at marriage, but stood to inherit more land after their parents' death.

Since one can inherit land from the matriclan as well as from one's own parents, inheritance was distinguished according to its source. Unlike other sites where we conducted similar surveys, the survey in Ghana was administered only to the head of household (usually male), since low levels of literacy among wives made it difficult for

[10] A total of 281 households were interviewed, but 23 were dropped for various reasons (including noncompletion of questionnaires for all three rounds). This brings the total to 258 households. The household tenure status can only be created for 257 households, since the tenure variable for some fields is missing in one household. Our subsequent discussion refers to 197 intact households (with both spouses present) with complete information for three generations. Unless otherwise specified, the discussion refers to this subsample.

[11] The grandchild generation is called the child generation for brevity.

them to answer questions that involved retrospective or recall information such as dates or years of birth.

An interesting feature of the Ghana survey is the complexity of inheritance sources and potential heirs, due to the uterine matrilineal system and the practice of polygyny. Under the matrilineal system, a person can inherit from a number of matrilineal relatives, depending on the order of succession. Due to polygyny and the practice of serial marriage, an individual may have several sets of maternal and paternal half-siblings.

Based on the above considerations, and after extensive pretests in the field, the inheritance retrospective was designed to capture the possibility of acquiring land from four sets of matrilineal relatives: the mother, maternal uncle, maternal grandmother, and other matrilineal relatives. Only one source of paternal inheritance was identified: the father. Respondents (heads of households) were also asked to list all their paternal and maternal full- and half-siblings. Interestingly enough, individuals were often uncertain how many half-siblings they had, particularly if one of their parents had moved to another village upon remarriage. Since not only siblings but also cousins, nieces, and nephews can inherit land from the matriclan, the number of heirs can potentially be very large. To simplify matters, the analysis is confined only to the siblings and half-siblings the respondent could name, and thus parental landholdings are not divided by the number of potential heirs to capture the effects of population pressure.

Table 1 presents summary statistics regarding the schooling of the parent, respondent, and child generations. Only households for which parental information is complete are included in the analysis; for the respondent generation, only children who survived to 21 years are included in the regressions. The age cutoff ensures that schooling decisions will have been completed in the respondent generation, although in practice children leave school much earlier. The general level of schooling in the parents' generation is low—84 percent of fathers have never been to school, compared to 94 percent of mothers—and fathers have more years of schooling than mothers. Among Akan households, fathers had 1.6 years compared to 0.3 years for mothers; among non-

Akans, fathers had 1.1 years and mothers 0.4 years. Schooling attainment has increased in the respondents' generation, but it is still low. The mean completed years of schooling for husbands in Akan areas is 7.2, while that of wives is 3.8; completed schooling is lower among non-Akans—4.6 years for husbands and 2.5 years for wives. The gender gap, however, seems to have narrowed in the respondent generation, reflecting the tendency for women's schooling levels to increase through time as public educational systems expand into more remote areas. The gap between males and females is much narrower in the child generation—it is larger for older children of the household head and smaller among the younger children. For example, among Akans, differences in schooling between male and female children are 1.7 years for those older than 21, 1.2 years for those between 13 and 21 years, and only 1.0 year for those between 7 and 21.

**Table 1—Demographic characteristics of sample individuals, by ethnic group of individual, Ghana**

| | Akan | | | | | Non-Akan | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Year of birth | | Years of schooling | | | Year of birth | | Years of schooling | |
| | N | Mean | Standard deviation | Mean | Standard deviation | N | Mean | Standard deviation | Mean | Standard deviation |
| Parents of head and resident spouses | | | | | | | | | | |
| Father | 301 | n.a. | | 1.6 | 3.5 | 86 | n.a. | | 1.1 | 3.1 |
| Mother | 315 | n.a. | | 0.3 | 1.5 | 74 | n.a. | | 0.4 | 1.8 |
| Respondents and spouses | | | | | | | | | | |
| Male | 147 | 1951 | 14.3 | 7.2 | 4.3 | 38 | 1948 | 14.0 | 4.6 | 5.2 |
| Female | 153 | 1958 | 12.0 | 3.8 | 5.0 | 38 | 1957 | 11.3 | 2.5 | 3.7 |
| Older children[a] | | | | | | | | | | |
| Male | 41 | 1967 | 6.7 | 8.6 | 4.9 | 14 | 1967 | 4.5 | 7.6 | 5.9 |
| Female | 35 | 1965 | 8.1 | 6.9 | 5.0 | 19 | 1965 | 6.1 | 7.1 | 4.6 |
| Younger children[b] | | | | | | | | | | |
| Male | 58 | 1979 | 2.6 | 7.6 | 2.9 | 14 | 1978 | 3.6 | 6.9 | 3.7 |
| Female | 58 | 1980 | 2.4 | 6.4 | 3.2 | 19 | 1979 | 2.2 | 6.5 | 3.5 |
| School-age children[c] | | | | | | | | | | |
| Male | 121 | 1982 | 6.9 | 5.3 | 3.6 | 21 | 1981 | 5.1 | 5.1 | 4.1 |
| Female | 141 | 1983 | 4.0 | 4.3 | 3.1 | 27 | 1981 | 4.2 | 5.5 | 3.4 |

Notes: The table is based on the subsample of 197 intact households with information for all three generations.
n.a. = not available.

[a] Children above 21 years.
[b] Children from 13 to 21 years.
[c] Children from 7 to 21 years of age.

Table 2 presents information on land owned by each generation. At the time of marriage or independent farming, Akan fathers had 8.3 hectares of land; mothers had only 1.6 hectares. Non-Akan fathers had 5.1 hectares, while mothers had 0.6. This is consistent with our previous analysis of household patterns of land acquisition (Quisumbing et al. 2001): men typically start farming independently by clearing forests, whereas women heads of household are less likely to acquire forestland. Non-Akans, who are migrants to the study area, do not have access to family land. In the respondents' generation, land sizes at the time of marriage had declined markedly for both males and females, and proposed sizes of land to be bestowed to children had likewise declined, but not by as much as the decline between the parents' and respondents' generation. However, it is interesting to note that disparities in landholding sizes between fathers and mothers are growing smaller, especially for Akan households. While fathers had five to nine times as much land as mothers in the parent generation, husbands had only twice as much land as their wives. In the child generation, Akan sons would stand to inherit about 40 percent more than their sisters, even though non-Akan sons would continue to inherit more than twice the land of their sisters. Thus, it seems clear that gender gaps in both land and schooling are narrowing through time, particularly among Akans.

**Table 2—Land owned, by ethnic group of individual, in hectares**

| | Akan | | | Non-Akan | | |
|---|---|---|---|---|---|---|
| | N | Mean | Standard deviation | N | Mean | Standard deviation |
| Respondents' parents generation[a] | | | | | | |
| Males | 209 | 8.3 | 10.7 | 60 | 5.1 | 6.7 |
| Females | 282 | 1.6 | 3.4 | 66 | 0.6 | 1.8 |
| Respondents' generation[b] | | | | | | |
| Males | 725 | 2.3 | 5.2 | 197 | 1.0 | 2.3 |
| Females | 579 | 0.9 | 1.7 | 135 | 0.6 | 0.8 |
| Respondents' children's generation[c] | | | | | | |
| Males | 169 | 1.3 | 1.9 | 36 | 1.5 | 2.1 |
| Females | 176 | 0.9 | 1.8 | 47 | 0.7 | 0.7 |

Note: The table is based on the subsample of 197 intact households with information for all three generations.

[a] Size of landholdings at the time of their marriage or independence from family.

[b] Land received from family in the form of inheritance, allocation, or gift. The sample consists of respondents and their siblings who were either living at the time of the survey or deceased but age 21 or over at the time of death.

[c] Includes land jointly given by father and mother. Living children age 7 or over only, children of intact couples only.

Although the land transfer questionnaire distinguished among four sources of matrilineal inheritance, in practice there were very few observations in each of the separate categories, so the analysis aggregated all the matrilineal categories.[12] The distribution of land received by mode of transfer—inheritance, allocation, and gift—from both maternal and paternal kin is presented in Table 3. The importance of each type of land transfer differs across Akans and non-Akans. For both Akan males and females, inheritance and gifts are the most important means of land transfer, with inherited land

**Table 3—Average size of land per person (in hectares) received from family by respondent and siblings in the form of inheritance, allocation, or gift, by ethnic group of head (includes only those currently living or deceased but were age 21 or over at time of death)**

| | Akan head | | | | Non-Akan head | | | |
|---|---|---|---|---|---|---|---|---|
| | Inherited | Allocated | Gift | Total | Inherited | Allocated | Gift | Total |
| Males in respondents' generation | | | | | | | | |
| From mother and matrikin | | | | | | | | |
| Mean | .71 | .11 | .38 | 1.20 | .18 | .02 | .06 | .25 |
| Standard deviation | 3.64 | .65 | 1.45 | 4.00 | 1.01 | 0.30 | .41 | 1.12 |
| N | 725 | 725 | 725 | 725 | 197 | 197 | 197 | 197 |
| From father | | | | | | | | |
| Mean | .57 | .07 | .47 | 1.11 | .59 | .02 | .13 | .73 |
| Standard deviation | 1.91 | .82 | 1.97 | 2.99 | 1.68 | .13 | .86 | 1.86 |
| N | 725 | 725 | 725 | 725 | 197 | 197 | 197 | 197 |
| Total | | | | | | | | |
| Mean | 1.28 | .18 | .85 | 2.31 | .76 | .04 | .18 | .98 |
| Standard deviation | 4.27 | 1.04 | 2.51 | 5.17 | 2.06 | .33 | 1.00 | 2.26 |
| N | 725 | 725 | 725 | 725 | 197 | 197 | 197 | 197 |
| Females in respondent's generation | | | | | | | | |
| From mother and matrikin | | | | | | | | |
| Mean | .11 | .05 | .13 | .30 | .12 | 0 | 0 | .12 |
| Standard deviation | 0.55 | .57 | 0.73 | 1.27 | .36 | 0 | 0 | .36 |
| N | 579 | 579 | 579 | 579 | 131 | 131 | 131 | 131 |
| From father | | | | | | | | |
| Mean | .36 | .02 | .20 | .59 | .43 | 0 | 0 | .43 |
| Standard deviation | 0.91 | .16 | .62 | 1.05 | .57 | 0 | 0 | .57 |
| N | 579 | 579 | 579 | 579 | 131 | 131 | 131 | 131 |
| Total | | | | | | | | |
| Mean | .48 | .07 | .33 | 0.88 | .55 | 0 | 0 | .55 |
| Standard deviation | 1.11 | .59 | 0.98 | 1.66 | 0.80 | 0 | 0 | .80 |
| N | 579 | 579 | 579 | 579 | 131 | 131 | 131 | 131 |

[12] Distinguishing among the different sources of matrilineal inheritance greatly improved survey response. However, since it was easier for respondents to identify a piece of land as coming from a specific relative, say a maternal uncle, than from a larger category called the matriclan.

areas slightly larger than those received as gifts. Inheritance is the most important form of land transfer for non-Akans. While gift transfers exist, they are not as important as a means of transferring wealth directly to one's children as they are among Akans, for whom gifts are a means of subverting the matrilineal inheritance system. Taking all land categories together, males receive more land than females.

Finally, we examine the transfer or bestowal intentions of respondents in Table 4. Regardless of ethnicity, most land to be bestowed to children comes from the father, as mothers bring less land to the marriage. While mothers' land tends to be more equally divided between sons and daughters, fathers tend to bestow their land preferentially to sons.

**Table 4—Mean size of land (hectares) to be bestowed[a] to children 7 years old or older, by ethnic group of parent (includes only children from intact households)**

| | Akan | | Non-Akan | |
|---|---|---|---|---|
| | **Father** | **Mother** | **Father** | **Mother** |
| Son | | | | |
| Mean | 1.12 | 0.10 | 1.45 | 0.21 |
| Standard deviation | 1.80 | 0.30 | 1.80 | 0.35 |
| N | 159 | 169 | 47 | 36 |
| Daughter | | | | |
| Mean | 0.77 | 0.10 | 0.80 | 0.20 |
| Standard deviation | 0.74 | 0.22 | 0.90 | 0.30 |
| N | 157 | 176 | 66 | 47 |

[a] Includes land already bestowed. The proportion of children to which some land is already bestowed is 4 percent.

## Determinants of Wealth Transfers in the Respondent Generation

Table 5 presents tobit regression results on the determinants of land transfers and years of schooling for the respondent and his or her siblings. We analyze four categories of land transfers: "permanent" transfers (the sum of inherited and gift land), inherited land, gift land, and "temporary" transfers or allocated land. Allocated land is allocated by the extended family to the individual for temporary use, and thus land rights are weaker than those for inherited and gift land (Quisumbing et al. 2001). Technically, allocated land should not be considered a permanent intergenerational transfer, although

**Table 5—Determinants of schooling, land inheritance, and family land allocation, respondent and siblings, tobit estimates**

Individuals who lived to at least age 21, whether living or dead at time of interview; village dummies included but coefficients not reported.

| | Inherited + gift land | | Inherited land | | Gift land | | Allocated land | | Schooling | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Coefficient | t-statistic | Coefficient | t-statistic | Coefficient | t-statistic | Coefficient | t-statistic | Coefficient | t-statistic |
| Daughter dummy | -0.757 | -1.17 | 0.364 | 0.48 | -2.472 | **-3.44** | -2.954 | **-3.52** | -4.960 | **-7.49** |
| Non-Akan dummy | -2.546 | **-3.13** | -0.935 | -1.01 | -6.791 | **-5.67** | -1.444 | -1.50 | -1.157 | -1.50 |
| Daughter x Non-Akan | 0.993 | 0.95 | 0.385 | 0.33 | n.a. | n.a. | -0.034 | -0.02 | -0.261 | -0.24 |
| Year of birth | 0.270 | 0.08 | -4.416 | -1.10 | 16.037 | **3.38** | 1.865 | 0.44 | 27.185 | **6.68** |
| (Birth year/1,000) squared | -70.454 | -0.08 | 1,126.330 | 1.09 | -4,096.502 | **-3.36** | -471.833 | -0.43 | -6,920.109 | **-6.62** |
| Half-sibling dummy | -1.920 | **-3.89** | -1.205 | **-2.06** | -2.897 | **-4.91** | -1.638 | **-2.81** | 0.407 | 0.88 |
| Number of brothers | -0.293 | **-2.91** | -0.063 | -0.53 | -0.573 | **-4.88** | 0.048 | 0.39 | -0.126 | -1.27 |
| Number of sisters | 0.203 | 1.92 | -0.072 | -0.58 | 0.386 | **3.07** | 0.269 | **2.25** | 0.499 | **4.82** |
| Eldest dummy | 0.523 | 0.76 | 0.556 | 0.69 | 0.657 | 0.87 | 0.470 | 0.57 | 0.454 | 0.63 |
| Youngest dummy | -0.945 | -1.27 | -0.590 | -0.68 | -0.944 | -1.13 | 0.119 | 0.14 | -0.122 | -0.17 |
| Father's schooling | -0.016 | -0.16 | -0.127 | -0.97 | 0.071 | 0.69 | -0.082 | -0.84 | 0.273 | **3.17** |
| Mother's schooling | -0.477 | **-2.00** | -1.810 | **-2.84** | -0.177 | -0.79 | 0.064 | 0.29 | -0.272 | -1.37 |
| Father's land | 0.162 | **8.65** | 0.161 | **7.41** | 0.062 | **2.82** | -0.044 | -1.36 | 0.060 | **2.91** |
| Mother's land | -0.158 | -1.93 | -0.080 | -0.93 | -0.402 | **-2.50** | 0.100 | 1.22 | 0.040 | 0.61 |
| Daughter × father's schooling | 0.025 | 0.15 | -0.047 | -0.22 | 0.155 | 0.92 | 0.384 | **2.30** | 0.055 | 0.38 |
| Daughter × mother's schooling | -0.010 | -0.02 | 1.209 | 1.37 | -0.398 | -0.80 | -0.413 | -0.84 | 0.465 | 1.29 |
| Daughter × father's land | -0.095 | **-2.60** | -0.127 | **-2.97** | 0.024 | 0.56 | 0.041 | 0.69 | -0.020 | -0.50 |
| Daughter × mother's land | 0.138 | 1.15 | 0.068 | 0.51 | 0.309 | 1.54 | -0.103 | -0.67 | 0.012 | 0.11 |
| Constant | -261.446 | -0.08 | 4,321.360 | 1.11 | -15,694.960 | **-3.39** | -1,845.007 | -0.44 | -26,691.730 | **-6.73** |
| F tests on coefficients | | | | | | | | | | |
| Father's schooling = mother's schooling | 2.39 | 0.12 | 6.24 | **0.01** | 0.75 | 0.39 | 0.29 | 0.59 | 4.85 | **0.03** |
| Father's land = mother's land | 13.75 | **0.00** | 6.86 | **0.01** | 7.79 | **0.01** | 2.28 | 0.13 | 0.08 | 0.78 |
| Daughter × father's schooling = daughter × mother's schooling | 0.00 | 0.95 | 1.71 | 0.19 | 0.88 | 0.35 | 1.88 | 0.17 | 0.84 | 0.36 |
| Daughter × father's land = daughter × mother's land | 3.11 | 0.08 | 1.77 | 0.18 | 1.78 | 0.18 | 0.61 | 0.43 | 0.07 | 0.79 |
| All education effects equal | 1.01 | 0.32 | 0.38 | 0.54 | 2.36 | 0.13 | 1.56 | 0.21 | 0.12 | 0.73 |
| All land effects equal | 0.67 | 0.41 | 0.15 | 0.70 | 1.31 | 0.25 | 0.00 | 1.00 | 0.01 | 0.91 |
| Number of observations | 1,270 | | 1,270 | | 1,270 | | 1,270 | | 1,270 | |
| Chi-square statistic | 191.25 | | 196.10 | | 237.91 | | 133.94 | | 465.60 | |
| p-value | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | |
| Number of censored observations | 656 | | 830 | | 1,038 | | 1,073 | | 552 | |
| Number of uncensored observations | 614 | | 440 | | 232 | | 197 | | 718 | |

Note: t-statistics in bold are significant at 5 percent or better.

land rights can be strengthened on such land through tree planting. We include it in the discussion to illustrate the contrast in transfer patterns between land with strong and weak land rights.

The daughter dummy is negative and significant in the gift and allocated land regressions. Although it may seem that daughters may claim use rights on food crop fields through allocation from their matrilineal families, this method of transfer is biased "socially" against women. Thus, regardless of land use type, women are disadvantaged in land transfer. The non-Akan dummy is negative and significant in the permanent land transfer equation. This reflects the greater difficulty of access to land by non-Akans, who tend to be migrants to the area. The interaction term between the daughter and non-Akan dummies is insignificant, suggesting the absence of stronger social discrimination against women in non-Akan communities.[13] As expected, half-siblings appear disadvantaged in land receipts. Interestingly, the number of brothers exerts a negative influence on all land received, while the number of sisters has a positive effect on total land and on allocated land. This suggests that brothers, rather than sisters, compete for the family's land resources, consistent with other findings for Ghana on sibling rivalry (Garg and Morduch 1998a, 1998b). Larger sizes of land owned by the father are positively associated with larger receipts of all land and inherited land by children. Judging from negative and significant coefficient of the interaction term between the daughter dummy and father's land in the inheritance regression, as well as in the total permanent land transfer regression, sons seem to be favored by their father when he owns more land.

We pay special attention to the gift equation, since this can be considered as an institutional innovation that makes it possible to transfer land to desired heirs. Gift transfers are less common among non-Akans, since there is no incentive to use inter-vivos transfers to prevent one's wealth from being absorbed by the matriclan at the expense of one's own children. Gifts also seem to have become more prevalent over

[13] The interaction term between the daughter dummy and the non-Akan dummy was not included in the gift land regression due to nonconvergence. Upon examination of the data, we found that the incidence of gift transfers among non-Akans was so low that there were hardly any significant variations.

time, as indicated by the positive coefficient on birth year, which outweighs the negative effect of its squared term. Father's land is positively associated with gift transfers, whereas mother's land has a negative effect, possibly because the matriclan still has claims on her land. It is worth emphasizing that the interaction terms between the daughter dummy and parental landownership are insignificant, which indicates the absence of parental discrimination against daughters with respect to gift transfers.

Gender disparities are more obvious in the schooling equation, where the daughter dummy is negative and highly significant. It is clear that daughters are subject to social discrimination in both land transfers and schooling investments. Schooling attainment does improve through time at a decelerating rate, as shown by the coefficients on birth year and its square. Both father's land and schooling exert a positive influence on child schooling completion, while mother's schooling does not have any effect. This is probably due to the extremely low levels of schooling among women of this generation. The number of sisters has a positive and significant effect on own schooling attainment, a result consistent with those of Garg and Morduch (1998b) for Ghana.[14] To the extent that parental landownership and schooling represent parental wealth, the absence of the significant effects of the interaction terms between the daughter dummy and parental land or schooling indicates the absence of parental discrimination associated with their wealth.

F-tests on coefficients suggest that the effects of paternal and maternal schooling are significantly different from each other in the inheritance and schooling equations, and that the coefficients of parental land also differ in the total land and inheritance equations. This leads us to reject the unitary model of household behavior in Ghana, consistent with findings of Doss (1996).

Because the estimates in Table 5 do not take into account possible effects of family-level unobservables that may affect the allocation of land and schooling across

[14] Garg and Morduch (1998a) find predicted improvements of as high as 40 percent in anthropometric measures of children in Ghana when shifting from a scenario where all siblings are brothers to one in which all are sisters. Garg and Morduch (1998b) also find that predicted enrollments in secondary school are increased by more than 50 percent when sifting from an all-brothers to all-sisters scenario, but they find negligible impacts on primary school enrollments.

siblings, we present family fixed-effects estimates in Table 6. The estimation sample for each equation is confined to those families that report making the particular type of land transfer to at least one child or sending at least one child to school. The results shown in Tables 5–6 are largely consistent. For example, even if family-level unobservables are controlled for, we still observe that daughters do worse in permanent land transfer only with respect to gifts. Half-siblings also fare worse generally with respect to permanent land transfers. However, none of the coefficients in the allocated land equation are significant in Table 6, perhaps because land allocation decisions are not made by biological parents but by the extended family.[15] Moreover, slightly stronger indications of parental preferences emerge in the inherited land equation. Mothers with more land and schooling seem to favor daughters. This type of land transfer is possible because land owned by mothers is often land they have received as a gift, and for which they have strong transfer rights. Fathers with more land favor sons, consistent with other studies on parental gender preference (Thomas 1994).[16] These results provide additional evidence against the unitary model of the household. While discrimination against daughters in land transfers does not seem pervasive, they are clearly disadvantaged with respect to schooling attainment. We return to an analysis of changes in total gender discrimination later.

## Determinants of Schooling and Proposed Land Transfers in the Child Generation

We now examine potential bequest and schooling decisions of the respondent and his wife. Table 7 shows tobit estimates of the determinants of expected land transfer to the respondent's children, disaggregated by source. This type of land transfer

[15] Since all children within the same household belong to the same extended family, "extended family unobservables" would also be controlled for using the family fixed-effects procedure. This may explain why the daughter dummy is negative in the levels regressions for allocated land, but not the fixed effects regressions.

[16] Thomas (1994) finds that in three countries, the United States, Brazil, and Ghana, the education level of the mother has a larger effect on daughter's height, and the education of the father has a larger effect on son's height.

**Table 6—Determinants of land inheritance, gifts, and schooling, respondent and siblings, fixed-effects tobit estimates**

Sample restricted to families that report land in the relevant category, and with at least two children.

| | Inherited + gift land | | Inherited land | | Gift land | | Allocated land | | Schooling | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Coefficient** | **t-statistic** | **Coefficient** | **t-statistic** | **Coefficient** | **t-statistic** | **Coefficient** | **t-statistic** | **Coefficient** | **t-statistic** |
| Daughter dummy | -0.320 | -1.08 | 2.431 | 0.85 | -3.432 | **-2.69** | -0.001 | 0.00 | -5.972 | **-5.65** |
| Daughter x Non-Akan | 0.265 | 1.14 | 3.245 | 0.74 | n.a. | n.a. | -0.715 | -0.24 | -2.797 | -1.07 |
| Year of birth | 0.812 | 1.70 | 3.380 | 0.30 | 10.960 | 1.08 | 0.515 | 0.20 | 26.150 | **4.01** |
| (Birth year/1,000) squared | -208.900 | -1.70 | -891.700 | -0.31 | -2,841.000 | -1.09 | -135.800 | -0.21 | -6,658.000 | **-4.00** |
| Half-sibling dummy | -0.342 | -1.92 | -4.952 | -1.52 | -4.041 | **-2.40** | -0.434 | -0.42 | 0.031 | 0.15 |
| Eldest dummy | 0.086 | 1.06 | 2.459 | 0.90 | -1.717 | -1.36 | -0.298 | -0.66 | 0.806 | 0.99 |
| Youngest dummy | -0.011 | -0.21 | -1.403 | -1.38 | -0.617 | -0.49 | -0.044 | -0.21 | -0.078 | -0.19 |
| Daughter × father's schooling | 0.016 | 0.57 | -0.039 | -0.05 | -0.016 | -0.02 | 0.109 | 0.34 | 0.086 | 0.43 |
| Daughter × mother's schooling | -0.203 | **-3.94** | 34.930 | **3.73** | -0.961 | -1.32 | -0.017 | -0.65 | 0.704 | **2.33** |
| Daughter × father's land | 0.003 | 0.43 | -0.930 | **-3.78** | -0.023 | -0.21 | 0.018 | 0.05 | 0.030 | 0.73 |
| Daughter × mother's land | 0.021 | 0.45 | 1.043 | **2.22** | -0.123 | -0.17 | -0.195 | -0.52 | 0.008 | 0.05 |
| Number of observations | 1,105 | | 595 | | 436 | | 409 | | 1,164 | |
| Chi-square statistic | 106.2 | | 54.5 | | 170.8 | | 7,029.7 | | 176.7 | |
| p-value | **0.00** | | **0.00** | | **0.00** | | **0.00** | | **0.00** | |

Notes: t-statistics in bold are significant at 5 percent or better. Estimator used is Honoré's least absolute deviations estimator.

corresponds loosely to the "permanent" land transfer category in the previous generation, since respondents no longer distinguished between "inheritance" and "gifts" in their plans to transfer land to their children. We did not include, however, land transfers from relatives. Thus, social discrimination is expected to appear, to the extent that parental land will be transferred to other members of the extended family. The sample is restricted to children of the respondents who are 7 and older, and who are alive at the time of the survey.

**Table 7—Determinants of expected land transfers and schooling, respondent's children, tobit estimates**

Living children age 7 years and above; village dummies included but coefficients not reported.

| | Levels estimates | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Land from husband | | Land from wife | | Land from both parents | | Years of schooling | |
| | Coefficient | t-statistic | Coefficient | t-statistic | Coefficient | t-statistic | Coefficient | t-statistic |
| Daughter dummy | -0.327 | -1.70 | -0.067 | -0.37 | -0.466 | **-2.46** | -2.130 | **-3.48** |
| Non-Akan dummy | 0.353 | 1.58 | -0.334 | -1.59 | -0.149 | -0.80 | -0.538 | -0.73 |
| Daughter × non-Akan | -0.824 | **-3.04** | 0.267 | 1.11 | | | -0.066 | -0.07 |
| Age | 0.007 | 0.27 | 0.025 | 1.17 | 0.018 | 0.65 | 0.801 | **9.79** |
| Age squared | 0.000 | 0.77 | 0.000 | -0.91 | 0.000 | 0.33 | -0.013 | **-7.84** |
| Number of brothers | -0.055 | -1.54 | -0.083 | **-2.72** | -0.110 | **-2.86** | 0.076 | 0.65 |
| Number of sisters | -0.023 | -0.74 | 0.008 | 0.28 | -0.016 | -0.48 | -0.092 | -0.91 |
| Father's schooling | -0.060 | **-3.44** | -0.001 | -0.08 | -0.076 | **-4.00** | -0.030 | -0.54 |
| Mother's schooling | -0.004 | -0.19 | 0.000 | 0.03 | -0.002 | -0.11 | -0.028 | -0.45 |
| Father's land | 0.016 | **2.64** | 0.007 | 0.83 | 0.017 | **2.57** | 0.025 | 1.24 |
| Mother's land | -0.001 | -0.03 | 0.026 | 0.95 | 0.006 | 0.16 | 0.049 | 0.41 |
| Daughter × father's schooling | 0.050 | **2.10** | 0.013 | 0.63 | 0.061 | **2.39** | 0.102 | 1.34 |
| Daughter × mother's schooling | -0.029 | -1.07 | 0.013 | 0.60 | -0.025 | -0.86 | 0.087 | 1.01 |
| Daughter × father's land | -0.006 | -0.75 | 0.000 | 0.02 | -0.005 | -0.59 | -0.006 | -0.23 |
| Daughter × mother's land | 0.092 | **2.0** | 0.005 | 0.16 | 0.062 | 1.33 | -0.144 | -0.96 |
| Constant | 0.738 | **2.24** | -0.263 | -0.95 | 1.083 | **3.02** | -3.348 | **-3.12** |
| F-tests on coefficients (p-value) | | | | | | | | |
| Father's schooling = mother' schooling | 3.35 | 0.07 | 0.00 | 0.95 | 4.88 | **0.03** | 0.00 | 0.98 |
| Father's land = mother's land | 0.21 | 0.65 | 0.34 | 0.56 | 0.07 | 0.79 | 0.04 | 0.85 |
| Daughter × father's schooling = daughter × mother's schooling | 3.37 | 0.07 | 0.00 | 0.98 | 3.47 | 0.06 | 0.01 | 0.91 |
| Daughter × father's land = daughter × mother's land | 4.31 | **0.04** | 0.02 | 0.90 | 1.79 | 0.18 | 0.73 | 0.39 |
| All education effects equal | 0.50 | 0.48 | 0.01 | 0.93 | 0.14 | 0.71 | 0.02 | 0.90 |
| All land effects equal | 5.70 | **0.02** | 0.51 | 0.48 | 2.36 | 0.13 | 0.96 | 0.33 |
| Number of observations | 509 | | 506 | | 506 | | 513 | |
| Chi-square | 175.02 | | 57.2 | | 150.34 | | 216.86 | |
| p-value | 0.00 | | 0.00 | | 0 | | 0.00 | |
| Number of censored observations | 92 | | 373 | | 63 | | 54 | |
| Number of uncensored observations | 417 | | 133 | | 443 | | 459 | |

Notes: estimator used is Honoré's least absolute deviations estimator. T-statistics in bold are significant at 5 percent or better.

It is found that daughters are clearly disadvantaged with respect to proposed bestowals of land from both parents. Transfers to daughters from their fathers appear to be smaller in non-Akan households. This is consistent with our contention that the evolution of the land tenure system among Akans favors wives and daughters. The number of brothers has negative and significant coefficients, suggesting that brothers continue to compete for the family's land, while the number of sisters does not seem to have such an effect. Unlike father's land, which has a positive and significant effect, father's schooling has a negative impact on land coming from the father, as well as on land from both parents (which is dominated by transfers from the father). It is possible that fathers who are better educated prefer to bequeath other forms of wealth to their children, such as nonland assets or education. It is also possible that better-educated fathers are in less land-intensive occupations. The negative effect of being a daughter is partly counteracted by the positive effects of the interaction term with father's schooling and mother's land, although this result is not robust to the inclusion of fixed effects (see below). It seems clear, however, that there is no significant parental discrimination against daughters among the children's generation.

F-tests on coefficients show that the coefficients on parents' land and their interaction with the daughter dummy differ significantly from each other in the equation for land from the husband. The coefficients of father's and mother's schooling also significantly differ from each other in the equation for land from both parents. These results indicate that the unitary model of the household can be rejected as far as land bestowal decisions are concerned.

To examine whether these results hold when family-level unobservables are considered, we reestimate the land and schooling equations with family fixed effects (Table 8). The sample is restricted to families with at least two children who make a land transfer to at least one child, or, in the case of the schooling equation, in which at least one child has attended school. This restriction reduces the number of observations in the estimation sample but is not subject to selection bias since selection into the sample is a

family-specific variable. Since there are very few families that report transfers of land from the wife, we were unable to estimate this equation with fixed effects.

**Table 8—Determinants of expected land transfers and schooling, respondent's children, fixed effects tobit estimates**

Living children age 7 and above; families with at least two children; land bestowals estimated for families that reported bestowal plans for at least one child.

| | Land from husband | | Land from both parents | | Years of schooling | |
|---|---|---|---|---|---|---|
| | Coefficient | t-statistic | Coefficient | t-statistic | Coefficient | t-statistic |
| Daughter dummy | 0.014 | 0.88 | 0.010 | 0.60 | -1.144 | **-2.06** |
| Daughter × non-Akan | -0.093 | -1.70 | -0.082 | -1.92 | -0.310 | -0.43 |
| Age | -0.001 | -0.30 | -0.001 | -0.27 | 1.032 | **11.67** |
| Age squared | 0.000 | 0.68 | 0.000 | 0.19 | -0.018 | **-8.95** |
| Daughter's father's schooling | -0.003 | -0.77 | -0.004 | -1.28 | 0.075 | 1.05 |
| Daughter's mother's schooling | 0.001 | 0.27 | 0.005 | 1.40 | 0.043 | 0.66 |
| Daughter's father's land | 0.000 | 0.12 | 0.000 | -0.01 | -0.012 | -1.66 |
| Daughter's mother's land | 0.005 | 1.43 | 0.004 | 1.51 | 0.026 | 0.48 |
| Number of observations | 318 | | 318 | | 512 | |
| Chi-square | 10.70 | | 9.10 | | 5,637.40 | |
| p-value | 22.20 | | 33.20 | | **0.00** | |

Note: t-statistics in bold are significant at 5 percent or better.

The most striking result from the fixed-effects estimates is the insignificance of the interaction terms between the daughter dummy and parental wealth variables. Such results support the hypothesis that parents are egalitarian with respect to the transfer of their own wealth. The results also show that daughters within the Akan ethnic group are no longer subject to social discrimination in land transfers but still suffer with respect to schooling, suggesting that different social factors affect land transfers and schooling investments. There is also indication that discrimination in land transfers against daughters persists in non-Akan families, although the coefficients are weakly significant.

Finally, we turn to the determinants of schooling investments in children age 7 and above exhibited in Tables 7–8. To take into account incomplete schooling decisions of younger children, we control for the correlation between age and school completion by including linear and quadratic terms in child age. We deal with censoring in schooling attainment also by using a tobit estimator, since a non-negligible proportion of children

has never attended school.[17] Levels estimates of schooling attainment point to gender disparities in schooling: girls do worse than boys in terms of years of schooling. This result is consistent with the fixed effects estimates (Table 8): daughters consistently get fewer years of schooling than their brothers. It is, however, important to emphasize that the coefficient of the daughter dummy is much smaller in the regression of the child generation than in the respondent's generation, indicating the declining gender gap in schooling over the two generations.

## Changing Patterns of Gender Discrimination

To rigorously test whether patterns of overall gender discrimination have changed across generations, we examine changes in the total discrimination effect, which is the sum of social and parental discrimination. We examine the sources of discrimination by differentiating equation (4) with respect to the daughter dummy, evaluating the interaction terms at the means for the parental resource variables, and testing whether the total effect is equal to zero. Using the estimation results shown in Tables 5 and 7, we present the results separately for each type of transfer and for each generation in Table 9.

In the respondent generation, there is significant bias against women in total land transfer among families of Akan ethnicity. This is due importantly to the strong bias

**Table 9—Tests for gender discrimination, respondent and child generation**

| | Respondent generation | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Inherited + gift | | Inherited land | | Gift | | Schooling | |
| **Total gender effects** | **F** | **p-value** | **F** | **p-value** | **F** | **p-value** | **F** | **p-value** |
| For Akans | 7.35 | 0.01 | 0.47 | 0.49 | 8.15 | 0.00 | 99.43 | 0.00 |
| For non-Akans | 0.26 | 0.61 | 0.00 | 0.96 | 12.60 | 0.00 | 29.20 | 0.00 |
| | **Child generation** | | | | | | | |
| | Land from father | | Land from mother | | Land from both | | Schooling | |
| | **F** | **p-value** | **F** | **p-value** | **F** | **p-value** | **F** | **p-value** |
| For Akans | 0.99 | 0.32 | 0.63 | 0.43 | 2.12 | 0.15 | 9.88 | 0.00 |
| For non-Akans | 12.67 | 0.00 | 1.99 | 0.16 | 0.90 | 0.34 | 5.99 | 0.01 |

Notes: P-values in bold indicate significance at 5 percent or better. Gender effects evaluated at means of respective ethnic groups for Akans and non-Akans. Coefficients from levels regressions.

[17] In this sample, 11 percent of children age 7 and older have never attended school.

against women in gift transfers, which arises primarily from strong social discrimination (see Table 5). In contrast, we found no significant discrimination in total land transfers among non-Akans, which may be partly explained by the relatively small sample size of non-Akans (see Table 1). Note, however, that total land transfers are the sum of different forms of land transfers. Significant social discrimination against females exists for both Akans and non-Akans, with stronger discrimination against non-Akan females as indicated by the size of the F-statistic.

Strong gender bias is observed in schooling for both ethnic groups. This can be attributed primarily to strong social discrimination against daughters, according to the estimation results in Table 5.

In the generation of the respondent's children, it is remarkable to find no significant discrimination against females among Akans in land transfers, despite weakly significant effects of the daughter dummy in the land transfer regressions reported in Table 7. However, we now clearly observe strong total discrimination among non-Akans with respect to total land transfer. It may well be that social discrimination against women persists in non-Akan patrilineal communities, where men generally dominate not only landownership but also decisions about farming and household affairs. Lastly, it must be pointed out that total discrimination against daughters persists in schooling for both Akans and non-Akans. Yet, it is important to note that F-values are much smaller for the child generation than the respondent generation, which reflects the declining gender gap in schooling over time.

## 4. Conclusions

It is often argued that women's land rights tend to decline as customary land tenure institutions evolve toward individualized ownership systems. While it is true that evolutionary changes toward individual ownership have been taking place in Ghana's Western Region, women's land rights have been strengthened rather than weakened over time. Gifts have recently emerged as an important way to transfer land from men to

women, thereby reducing the social discrimination against women in land transfers. It is important to recall that gifts are allowed by the extended family only if wives and children help the husband establish cocoa fields (which require a lot of female labor for weeding). Thus, the increasing transfer of land to wives and daughters is consistent with the increasing demand for female labor as land use intensifies. Such long-term changes have been supported by the absence of strong parental discrimination against daughters. It is important to note that such equity-improving changes in land transfers have been achieved without sacrificing farming efficiency. Quisumbing et al. (2001) found no evidence of lower production efficiency on cocoa farms owned by female farmers.

Gender differences in schooling have been also declining in Ghana's Western Region, primarily because of declining social discrimination. Although we have not analyzed the social and economic forces underlying such changes, we conjecture that building schools in remote villages and increasing nonfarm employment opportunities for women have increased parental investments in daughters' schooling. Moreover, as school enrollments approach universal, it is natural for the gender gap in schooling attainment to close. More rigorous analysis has to be performed, however, to achieve a deeper understanding of the declining gender gap in schooling in Ghana's Western Region.

Whether our results can be generalized is a major remaining empirical issue. First, this is a case in which an agricultural technology (cocoa farming) increased demand for female labor, and hence increased women's economic value and bargaining power. Individualization of tenure was in part a means of providing an incentive to invest in the land, particularly by women. In other cases where women's labor was less important for cash cropping, individualization might still decrease women's control over land (as argued by other writers on women's land rights in Sub-Saharan Africa, e.g., Lastarria-Cornhiel 1998).

While our parallel studies in the Philippines and Indonesia (Estudillo, Quisumbing, and Otsuka 2001a, 2001b; Quisumbing and Otsuka 2001) also find that parents are basically egalitarian with respect to land transfers and schooling investment,

these studies were also conducted in bilateral or matrilineal societies, which have a generally egalitarian social structure. It would be rash to conclude that this is the case in Ghana, however, where other studies using nationally representative data sets (Quisumbing et al. 2001) have found significantly higher poverty measures among women and female heads of households. Moreover, all three cases that we have studied (including Ghana) have matrilineal or bilateral inheritance traditions—a fact that may limit its generalizability. The majority of cultures throughout the world practice patrilineal inheritance, and like the non-Akans in this study, discrimination against females is usually stronger. Intergenerational transfers in patrilineal societies deserve further study.

Regardless of parental transfer motives, a major policy effort should be made to remove or reduce social discrimination by providing fair access to schooling or promulgating egalitarian succession laws. Further compilation of empirical knowledge, however, will be required before drawing clearer policy implications.

## References

Agarwal, B. 1994. *A field of one's own: Gender and land rights in South Asia*. Cambridge: Cambridge University Press.

Awusabo-Asare, K. 1990. Matriliny and the New Intestate Succession Law of Ghana. *Canadian Journal of African Studies* 24 (1): 1-16.

Becker, G. S. 1974. A theory of social interactions. *Journal of Political Economy* 82 (6): 1063-1093.

Becker, G. S., and N. Tomes. 1986. Human capital and the rise and fall of families. *Journal of Labor Economics* 4 (3): S1-S39.

Behrman, J. R., R. Pollak, and P. Taubman. 1982. Parental preferences and provision for progeny. *Journal of Political Economy* 90 (1): 52-73.

Besley, T. Property rights and investment incentives. *Journal of Political Economy* 103 (5): 913-937.

Butcher, K., and A. Case. 1994. The effect of sibling sex composition on women's education and earnings. *Quarterly Journal of Economics* 109 (3): 531-563.

Doss, C. R. 1996. *Women's bargaining power in household economic decisions: Evidence from Ghana*. Staff Paper P96-11. Minneapolis/St. Paul, Minnesota: Department of Applied Economics, University of Minnesota.

Estudillo, J. P., A. R. Quisumbing, and K. Otsuka. 2001a. Gender difference in land inheritance and schooling investments in the rural Philippines. *Land Economics* 77 (1): 130-143.

_____. 2001b. Gender differences in land inheritance, schooling, and lifetime income: Evidence from the rural Philippines. *Journal of Development Studies* 37 (4): 23-48.

Garg, A., and J. Morduch. 1998a. Sibling rivalry and the gender gap: Evidence from child health outcomes in Ghana. *Journal of Population Economics* 11 (4): 471-493.

_____. 1998b. *Sibling rivalry*. Working paper. Princeton, N.J.: Woodrow Wilson School, Princeton University.

Gray, L., and M. Kevane. 1999. Diminished access, diverted exclusion: Women and land tenure in Sub-Saharan Africa. *African Studies Review* 42 (2): 15-39.

Haddad, L., J. Hoddinott, and H. Alderman, eds. 1997. *Intrahousehold resource allocation in developing countries: Methods, models, and policy*. Baltimore, Md., U.S.A.: Johns Hopkins University Press.

Hill, P. 1963. *The migrant cocoa-farmers of Southern Ghana: A study in rural capitalism*. Cambridge: Cambridge University Press.

Honoré, B. 1992. Trimmed LAD and least squares estimation of truncated and censored regression models with fixed effects, *Econometrica* 60 (3): 533-565.

Hsiao, C. 1986. *Analysis of panel data*. Econometric Society Monographs No. 11. Cambridge: Cambridge University Press.

Lastarria-Cornhiel, S. 1997. Impact of privatization on gender and property rights in Africa. *World Development* 25 (8): 1317-1333.

McElroy, M. B. 1990. The empirical content of Nash-bargained household behavior. *Journal of Human Resources* 25 (4): 559-583.

Morduch, J. 2000. Sibling rivalry in Africa. *American Economic Review* 90 (2): 405-409.

Otsuka, K., S. Suyanto, T. Sonobe, and T. P. Tomich. 2001. Evolution of customary land tenure and development of agroforestry: Evidence from Sumatra. *Agricultural Economics* 25 (1): 85-101.

Pitt, M. M., and M. R. Rosenzweig. 1990. Estimating the intrahousehold incidence of illness: Child health and gender inequality in the allocation of time. *International Economic Review* 31 (4): pp. 969-980.

Pitt, M. M., M. R. Rosenzweig, and M. N. Hassan. 1990. Productivity, health, and inequality in the intrahousehold distribution of food in low-income countries. *American Economic Review* 80 (5): 1139-1156.

Place, F., and K. Otsuka. 2000. Population pressure, land tenure, and tree resource management in Uganda. *Land Economics* 76 (2): 233-251.

_____. 2001a. Population, land tenure, and natural resource management in Malawi. *Journal of Environmental Economics and Management* 41 (1): 13-32.

_____. 2001b. Tenure, agricultural investment, productivity in customary tenure sector of Malawi. *Economic Development and Cultural Change* 50 (1): 77-99.

Quisumbing, A. R. 1994. Intergenerational transfers in Philippine rice villages: Gender differences in traditional inheritance customs. *Journal of Development Economics* 43 (2): 167-195.

Quisumbing, A. R., and K. Otsuka. 2001. Land inheritance and schooling in matrilineal societies: Evidence from Sumatra. *World Development* 29 (12): 2093-2110.

Quisumbing, A. R., J. P. Estudillo, and K. Otsuka. 2004. *Land and schooling: Transferring wealth across generations*. Baltimore, Md., U.S.A.: Johns Hopkins University Press for the International Food Policy Research Institute.

Quisumbing, A. R., E. Payongayong, J. B. Aidoo, and K. Otsuka. 2001. Women's land rights in the transition to individualized ownership: Implications for the management of tree resources in Western Ghana. *Economic Development and Cultural Change* 50 (1): 157-182.

Rosenzweig, M. R. 1986. Program interventions, intrahousehold distribution, and the welfare of individuals: Modeling household behavior. *World Development* 14 (2): 233-243.

Thomas, D. 1990. Intrahousehold resource allocation: An inferential approach. *Journal of Human Resources* 25 (4): 635-664.

_____. 1994. Like father, like son; like mother, like daughter: Parental resources and child height. *Journal of Human Resources* 29 (4): 950-988.

## FCND DISCUSSION PAPERS

**185** *Assets at Marriage in Rural Ethiopia*, Marcel Fafchamps and Agnes Quisumbing, August 2004

**184** *Impact Evaluation of a Conditional Cash Transfer Program: The Nicaraguan* Red de Protección Social, John A. Maluccio and Rafael Flores, July 2004

**183** *Poverty in Malawi, 1998*, Todd Benson, Charles Machinjili, and Lawrence Kachikopa, July 2004

**182** *Race, Equity, and Public Schools in Post-Apartheid South Africa: Is Opportunity Equal for All Kids?* Futoshi Yamauchi, June 2004

**181** *Scaling Up Community-Driven Development: A Synthesis of Experience*, Stuart Gillespie, June 2004

**180** *Kudumbashree—Collective Action for Poverty Alleviation and Women's Employment*, Suneetha Kadiyala, May 2004

**179** *Scaling Up HIV/AIDS Interventions Through Expanded Partnerships (STEPs) in Malawi*, Suneetha Kadiyala, May 2004

**178** *Community-Driven Development and Scaling Up of Microfinance Services: Case Studies from Nepal and India*, Manohar P. Sharma, April 2004

**177** *Community Empowerment and Scaling Up in Urban Areas: The Evolution of PUSH/PROSPECT in Zambia*, James Garrett, April 2004

**176** *Why Is Child Malnutrition Lower in Urban than Rural Areas? Evidence from 36 Developing Countries*, Lisa C. Smith, Marie T. Ruel, and Aida Ndiaye, March 2004

**175** *Consumption Smoothing and Vulnerability in the Zone Lacustre, Mali*, Sarah Harrower and John Hoddinott, March 2004

**174** *The Cost of Poverty Alleviation Transfer Programs: A Comparative Analysis of Three Programs in Latin America*, Natàlia Caldés, David Coady, and John A. Maluccio, February 2004

**173** *Food Aid Distribution in Bangladesh: Leakage and Operational Performance*, Akhter U. Ahmed, Shahidur Rashid, Manohar Sharma, and Sajjad Zohir in collaboration with Mohammed Khaliquzzaman, Sayedur Rahman, and the Data Analysis and Technical Assistance Limited, February 2004

**172** *Designing and Evaluating Social Safety Nets: Theory, Evidence, and Policy Conclusions*, David P. Coady, January 2004

**171** *Living Life: Overlooked Aspects of Urban Employment*, James Garrett, January 2004

**170** *From Research to Program Design: Use of Formative Research in Haiti to Develop a Behavior Change Communication Program to Prevent Malnutrition*, Purnima Menon, Marie T. Ruel, Cornelia Loechl, and Gretel Pelto, December 2003

**169** *Nonmarket Networks Among Migrants: Evidence from Metropolitan Bangkok, Thailand*, Futoshi Yamauchi and Sakiko Tanabe, December 2003

**168** *Long-Term Consequences of Early Childhood Malnutrition*, Harold Alderman, John Hoddinott, and Bill Kinsey, December 2003

**167** *Public Spending and Poverty in Mozambique*, Rasmus Heltberg, Kenneth Simler, and Finn Tarp, December 2003

**166** *Are Experience and Schooling Complementary? Evidence from Migrants' Assimilation in the Bangkok Labor Market*, Futoshi Yamauchi, December 2003

**165** *What Can Food Policy Do to Redirect the Diet Transition?* Lawrence Haddad, December 2003

**164** *Impacts of Agricultural Research on Poverty: Findings of an Integrated Economic and Social Analysis*, Ruth Meinzen-Dick, Michelle Adato, Lawrence Haddad, and Peter Hazell, October 2003

**163** *An Integrated Economic and Social Analysis to Assess the Impact of Vegetable and Fishpond Technologies on Poverty in Rural Bangladesh*, Kelly Hallman, David Lewis, and Suraiya Begum, October 2003

**162** *The Impact of Improved Maize Germplasm on Poverty Alleviation: The Case of Tuxpeño-Derived Material in Mexico*, Mauricio R. Bellon, Michelle Adato, Javier Becerril, and Dubravka Mindek, October 2003

## FCND DISCUSSION PAPERS

**161** *Assessing the Impact of High-Yielding Varieties of Maize in Resettlement Areas of Zimbabwe*, Michael Bourdillon, Paul Hebinck, John Hoddinott, Bill Kinsey, John Marondo, Netsayi Mudege, and Trudy Owens, October 2003

**160** *The Impact of Agroforestry-Based Soil Fertility Replenishment Practices on the Poor in Western Kenya*, Frank Place, Michelle Adato, Paul Hebinck, and Mary Omosa, October 2003

**159** *Rethinking Food Aid to Fight HIV/AIDS*, Suneetha Kadiyala and Stuart Gillespie, October 2003

**158** *Food Aid and Child Nutrition in Rural Ethiopia*, Agnes R. Quisumbing, September 2003

**157** *HIV/AIDS, Food Security, and Rural Livelihoods: Understanding and Responding*, Michael Loevinsohn and Stuart Gillespie, September 2003

**156** *Public Policy, Food Markets, and Household Coping Strategies in Bangladesh: Lessons from the 1998 Floods*, Carlo del Ninno, Paul A. Dorosh, and Lisa C. Smith, September 2003

**155** *Consumption Insurance and Vulnerability to Poverty: A Synthesis of the Evidence from Bangladesh, Ethiopia, Mali, Mexico, and Russia*, Emmanuel Skoufias and Agnes R. Quisumbing, August 2003

**154** *Cultivating Nutrition: A Survey of Viewpoints on Integrating Agriculture and Nutrition*, Carol E. Levin, Jennifer Long, Kenneth R. Simler, and Charlotte Johnson-Welch, July 2003

**153** Maquiladoras *and Market Mamas: Women's Work and Childcare in Guatemala City and Accra*, Agnes R. Quisumbing, Kelly Hallman, and Marie T. Ruel, June 2003

**152** *Income Diversification in Zimbabwe: Welfare Implications From Urban and Rural Areas*, Lire Ersado, June 2003

**151** *Childcare and Work: Joint Decisions Among Women in Poor Neighborhoods of Guatemala City*, Kelly Hallman, Agnes R. Quisumbing, Marie T. Ruel, and Bénédicte de la Brière, June 2003

**150** *The Impact of* PROGRESA *on Food Consumption*, John Hoddinott and Emmanuel Skoufias, May 2003

**149** *Do Crowded Classrooms Crowd Out Learning? Evidence From the Food for Education Program in Bangladesh*, Akhter U. Ahmed and Mary Arends-Kuenning, May 2003

**148** *Stunted Child-Overweight Mother Pairs: An Emerging Policy Concern?* James L. Garrett and Marie T. Ruel, April 2003

**147** *Are Neighbors Equal? Estimating Local Inequality in Three Developing Countries*, Chris Elbers, Peter Lanjouw, Johan Mistiaen, Berk Özler, and Kenneth Simler, April 2003

**146** *Moving Forward with Complementary Feeding: Indicators and Research Priorities*, Marie T. Ruel, Kenneth H. Brown, and Laura E. Caulfield, April 2003

**145** *Child Labor and School Decisions in Urban and Rural Areas: Cross Country Evidence*, Lire Ersado, December 2002

**144** *Targeting Outcomes Redux*, David Coady, Margaret Grosh, and John Hoddinott, December 2002

**143** *Progress in Developing an Infant and Child Feeding Index: An Example Using the Ethiopia Demographic and Health Survey 2000*, Mary Arimond and Marie T. Ruel, December 2002

**142** *Social Capital and Coping With Economic Shocks: An Analysis of Stunting of South African Children*, Michael R. Carter and John A. Maluccio, December 2002

**141** *The Sensitivity of Calorie-Income Demand Elasticity to Price Changes: Evidence from Indonesia*, Emmanuel Skoufias, November 2002

**140** *Is Dietary Diversity an Indicator of Food Security or Dietary Quality? A Review of Measurement Issues and Research Needs*, Marie T. Ruel, November 2002

**139** *Can South Africa Afford to Become Africa's First Welfare State?* James Thurlow, October 2002

**138** *The Food for Education Program in Bangladesh: An Evaluation of its Impact on Educational Attainment and Food Security*, Akhter U. Ahmed and Carlo del Ninno, September 2002

**137** *Reducing Child Undernutrition: How Far Does Income Growth Take Us?* Lawrence Haddad, Harold Alderman, Simon Appleton, Lina Song, and Yisehac Yohannes, August 2002

## FCND DISCUSSION PAPERS

**136** *Dietary Diversity as a Food Security Indicator*, John Hoddinott and Yisehac Yohannes, June 2002

**135** *Trust, Membership in Groups, and Household Welfare: Evidence from KwaZulu-Natal, South Africa*, Lawrence Haddad and John A. Maluccio, May 2002

**134** *In-Kind Transfers and Household Food Consumption: Implications for Targeted Food Programs in Bangladesh*, Carlo del Ninno and Paul A. Dorosh, May 2002

**133** *Avoiding Chronic and Transitory Poverty: Evidence From Egypt, 1997-99*, Lawrence Haddad and Akhter U. Ahmed, May 2002

**132** *Weighing What's Practical: Proxy Means Tests for Targeting Food Subsidies in Egypt*, Akhter U. Ahmed and Howarth E. Bouis, May 2002

**131** *Does Subsidized Childcare Help Poor Working Women in Urban Areas? Evaluation of a Government-Sponsored Program in Guatemala City*, Marie T. Ruel, Bénédicte de la Brière, Kelly Hallman, Agnes Quisumbing, and Nora Coj, April 2002

**130** *Creating a Child Feeding Index Using the Demographic and Health Surveys: An Example from Latin America*, Marie T. Ruel and Purnima Menon, April 2002

**129** *Labor Market Shocks and Their Impacts on Work and Schooling: Evidence from Urban Mexico*, Emmanuel Skoufias and Susan W. Parker, March 2002

**128** *Assessing the Impact of Agricultural Research on Poverty Using the Sustainable Livelihoods Framework*, Michelle Adato and Ruth Meinzen-Dick, March 2002

**127** *A Cost-Effectiveness Analysis of Demand- and Supply-Side Education Interventions: The Case of* PROGRESA *in Mexico*, David P. Coady and Susan W. Parker, March 2002

**126** *Health Care Demand in Rural Mozambique: Evidence from the 1996/97 Household Survey*, Magnus Lindelow, February 2002

**125** *Are the Welfare Losses from Imperfect Targeting Important?*, Emmanuel Skoufias and David Coady, January 2002

**124** *The Robustness of Poverty Profiles Reconsidered*, Finn Tarp, Kenneth Simler, Cristina Matusse, Rasmus Heltberg, and Gabriel Dava, January 2002

**123** *Conditional Cash Transfers and Their Impact on Child Work and Schooling: Evidence from the* PROGRESA *Program in Mexico*, Emmanuel Skoufias and Susan W. Parker, October 2001

**122** *Strengthening Public Safety Nets: Can the Informal Sector Show the Way?*, Jonathan Morduch and Manohar Sharma, September 2001

**121** *Targeting Poverty Through Community-Based Public Works Programs: A Cross-Disciplinary Assessment of Recent Experience in South Africa*, Michelle Adato and Lawrence Haddad, August 2001

**120** *Control and Ownership of Assets Within Rural Ethiopian Households*, Marcel Fafchamps and Agnes R. Quisumbing, August 2001

**119** *Assessing Care: Progress Towards the Measurement of Selected Childcare and Feeding Practices, and Implications for Programs*, Mary Arimond and Marie T. Ruel, August 2001

**118** *Is* PROGRESA *Working? Summary of the Results of an Evaluation by IFPRI*, Emmanuel Skoufias and Bonnie McClafferty, July 2001

**117** *Evaluation of the Distributional Power of* PROGRESA*'s Cash Transfers in Mexico*, David P. Coady, July 2001

**116** *A Multiple-Method Approach to Studying Childcare in an Urban Environment: The Case of Accra, Ghana*, Marie T. Ruel, Margaret Armar-Klemesu, and Mary Arimond, June 2001

**115** *Are Women Overrepresented Among the Poor? An Analysis of Poverty in Ten Developing Countries*, Agnes R. Quisumbing, Lawrence Haddad, and Christina Peña, June 2001

**114** *Distribution, Growth, and Performance of Microfinance Institutions in Africa, Asia, and Latin America*, Cécile Lapenu and Manfred Zeller, June 2001

## FCND DISCUSSION PAPERS

**113** *Measuring Power,* Elizabeth Frankenberg and Duncan Thomas, June 2001

**112** *Effective Food and Nutrition Policy Responses to HIV/AIDS: What We Know and What We Need to Know*, Lawrence Haddad and Stuart Gillespie, June 2001

**111** *An Operational Tool for Evaluating Poverty Outreach of Development Policies and Projects*, Manfred Zeller, Manohar Sharma, Carla Henry, and Cécile Lapenu, June 2001

**110** *Evaluating Transfer Programs Within a General Equilibrium Framework*, Dave Coady and Rebecca Lee Harris, June 2001

**109** *Does Cash Crop Adoption Detract From Childcare Provision? Evidence From Rural Nepal*, Michael J. Paolisso, Kelly Hallman, Lawrence Haddad, and Shibesh Regmi, April 2001

**108** *How Efficiently Do Employment Programs Transfer Benefits to the Poor? Evidence from South Africa*, Lawrence Haddad and Michelle Adato, April 2001

**107** *Rapid Assessments in Urban Areas: Lessons from Bangladesh and Tanzania*, James L. Garrett and Jeanne Downen, April 2001

**106** *Strengthening Capacity to Improve Nutrition*, Stuart Gillespie, March 2001

**105** *The Nutritional Transition and Diet-Related Chronic Diseases in Asia: Implications for Prevention*, Barry M. Popkin, Sue Horton, and Soowon Kim, March 2001

**104** *An Evaluation of the Impact of PROGRESA on Preschool Child Height*, Jere R. Behrman and John Hoddinott, March 2001

**103** *Targeting the Poor in Mexico: An Evaluation of the Selection of Households for PROGRESA*, Emmanuel Skoufias, Benjamin Davis, and Sergio de la Vega, March 2001

**102** *School Subsidies for the Poor: Evaluating a Mexican Strategy for Reducing Poverty*, T. Paul Schultz, March 2001

**101** *Poverty, Inequality, and Spillover in Mexico's Education, Health, and Nutrition Program*, Sudhanshu Handa, Mari-Carmen Huerta, Raul Perez, and Beatriz Straffon, March 2001

**100** *On the Targeting and Redistributive Efficiencies of Alternative Transfer Instruments*, David Coady and Emmanuel Skoufias, March 2001

**99** *Cash Transfer Programs with Income Multipliers: PROCAMPO in Mexico*, Elisabeth Sadoulet, Alain de Janvry, and Benjamin Davis, January 2001

**98** *Participation and Poverty Reduction: Issues, Theory, and New Evidence from South Africa*, John Hoddinott, Michelle Adato, Tim Besley, and Lawrence Haddad, January 2001

**97** *Socioeconomic Differentials in Child Stunting Are Consistently Larger in Urban Than in Rural Areas*, Purnima Menon, Marie T. Ruel, and Saul S. Morris, December 2000

**96** *Attrition in Longitudinal Household Survey Data: Some Tests for Three Developing-Country Samples*, Harold Alderman, Jere R. Behrman, Hans-Peter Kohler, John A. Maluccio, Susan Cotts Watkins, October 2000

**95** *Attrition in the Kwazulu Natal Income Dynamics Study 1993-1998*, John Maluccio, October 2000

**94** *Targeting Urban Malnutrition: A Multicity Analysis of the Spatial Distribution of Childhood Nutritional Status*, Saul Sutkover Morris, September 2000

**93** *Mother-Father Resource Control, Marriage Payments, and Girl-Boy Health in Rural Bangladesh*, Kelly K. Hallman, September 2000

**92** *Assessing the Potential for Food-Based Strategies to Reduce Vitamin A and Iron Deficiencies: A Review of Recent Evidence*, Marie T. Ruel and Carol E. Levin, July 2000

**91** *Comparing Village Characteristics Derived From Rapid Appraisals and Household Surveys: A Tale From Northern Mali*, Luc Christiaensen, John Hoddinott, and Gilles Bergeron, July 2000

**90** *Empirical Measurements of Households' Access to Credit and Credit Constraints in Developing Countries: Methodological Issues and Evidence*, Aliou Diagne, Manfred Zeller, and Manohar Sharma, July 2000

**89** *The Role of the State in Promoting Microfinance Institutions*, Cécile Lapenu, June 2000

## FCND DISCUSSION PAPERS

**88** *The Determinants of Employment Status in Egypt*, Ragui Assaad, Fatma El-Hamidi, and Akhter U. Ahmed, June 2000

**87** *Changes in Intrahousehold Labor Allocation to Environmental Goods Collection: A Case Study from Rural Nepal*, Priscilla A. Cooke, May 2000

**86** *Women's Assets and Intrahousehold Allocation in Rural Bangladesh: Testing Measures of Bargaining Power*, Agnes R. Quisumbing and Bénédicte de la Brière, April 2000

**85** *Intrahousehold Impact of Transfer of Modern Agricultural Technology: A Gender Perspective*, Ruchira Tabassum Naved, April 2000

**84** *Intrahousehold Allocation and Gender Relations: New Empirical Evidence from Four Developing Countries*, Agnes R. Quisumbing and John A. Maluccio, April 2000

**83** *Quality or Quantity? The Supply-Side Determinants of Primary Schooling in Rural Mozambique*, Sudhanshu Handa and Kenneth R. Simler, March 2000

**82** *Pathways of Rural Development in Madagascar: An Empirical Investigation of the Critical Triangle of Environmental Sustainability, Economic Growth, and Poverty Alleviation*, Manfred Zeller, Cécile Lapenu, Bart Minten, Eliane Ralison, Désiré Randrianaivo, and Claude Randrianarisoa, March 2000

**81** *The Constraints to Good Child Care Practices in Accra: Implications for Programs*, Margaret Armar-Klemesu, Marie T. Ruel, Daniel G. Maxwell, Carol E. Levin, and Saul S. Morris, February 2000

**80** *Nontraditional Crops and Land Accumulation Among Guatemalan Smallholders: Is the Impact Sustainable?* Calogero Carletto, February 2000

**79** *Adult Health in the Time of Drought*, John Hoddinott and Bill Kinsey, January 2000

**78** *Determinants of Poverty in Mozambique: 1996-97*, Gaurav Datt, Kenneth Simler, Sanjukta Mukherjee, and Gabriel Dava, January 2000

**77** *The Political Economy of Food Subsidy Reform in Egypt*, Tammi Gutner, November 1999.

**76** *Raising Primary School Enrolment in Developing Countries: The Relative Importance of Supply and Demand*, Sudhanshu Handa, November 1999

**75** *Determinants of Poverty in Egypt, 1997*, Gaurav *Datt* and Dean Jolliffe, October 1999

**74** *Can Cash Transfer Programs Work in Resource-Poor Countries? The Experience in Mozambique*, Jan W. Low, James L. Garrett, and Vitória Ginja, October 1999

**73** *Social Roles, Human Capital, and the Intrahousehold Division of Labor: Evidence from Pakistan*, Marcel Fafchamps and Agnes R. Quisumbing, October 1999

**72** *Validity of Rapid Estimates of Household Wealth and Income for Health Surveys in Rural Africa*, Saul S. Morris, Calogero Carletto, John Hoddinott, and Luc J. M. Christiaensen, October 1999

**71** *Social Capital and Income Generation in South Africa, 1993-98*, John Maluccio, Lawrence Haddad, and Julian May, September 1999

**70** *Child Health Care Demand in a Developing Country: Unconditional Estimates from the Philippines*, Kelly Hallman, August 1999

**69** *Supply Response of West African Agricultural Households: Implications of Intrahousehold Preference Heterogeneity*, Lisa C. Smith and Jean-Paul Chavas, July 1999

**68** *Early Childhood Nutrition and Academic Achievement: A Longitudinal Analysis*, Paul Glewwe, Hanan Jacoby, and Elizabeth King, May 1999

**67** *Determinants of Household Access to and Participation in Formal and Informal Credit Markets in Malawi*, Aliou Diagne, April 1999

**66** *Working Women in an Urban Setting: Traders, Vendors, and Food Security in Accra*, Carol E. Levin, Daniel G. Maxwell, Margaret Armar-Klemesu, Marie T. Ruel, Saul S. Morris, and Clement Ahiadeke, April 1999

**65** *Are Determinants of Rural and Urban Food Security and Nutritional Status Different? Some Insights from Mozambique*, James L. Garrett and Marie T. Ruel, April 1999

## FCND DISCUSSION PAPERS

**64** *Some Urban Facts of Life: Implications for Research and Policy*, Marie T. Ruel, Lawrence Haddad, and James L. Garrett, April 1999

**63** *Are Urban Poverty and Undernutrition Growing? Some Newly Assembled Evidence*, Lawrence Haddad, Marie T. Ruel, and James L. Garrett, April 1999

**62** *Good Care Practices Can Mitigate the Negative Effects of Poverty and Low Maternal Schooling on Children's Nutritional Status: Evidence from Accra*, Marie T. Ruel, Carol E. Levin, Margaret Armar-Klemesu, Daniel Maxwell, and Saul S. Morris, April 1999

**61** *Does Geographic Targeting of Nutrition Interventions Make Sense in Cities? Evidence from Abidjan and Accra*, Saul S. Morris, Carol Levin, Margaret Armar-Klemesu, Daniel Maxwell, and Marie T. Ruel, April 1999

**60** *Explaining Child Malnutrition in Developing Countries: A Cross-Country Analysis*, Lisa C. Smith and Lawrence Haddad, April 1999

**59** *Placement and Outreach of Group-Based Credit Organizations: The Cases of ASA, BRAC, and PROSHIKA in Bangladesh*, Manohar Sharma and Manfred Zeller, March 1999

**58** *Women's Land Rights in the Transition to Individualized Ownership: Implications for the Management of Tree Resources in Western Ghana*, Agnes Quisumbing, Ellen Payongayong, J. B. Aidoo, and Keijiro Otsuka, February 1999

**57** *The Structure of Wages During the Economic Transition in Romania*, Emmanuel Skoufias, February 1999

**56** *How Does the Human Rights Perspective Help to Shape the Food and Nutrition Policy Research Agenda?*, Lawrence Haddad and Arne Oshaug, February 1999

**55** *Efficiency in Intrahousehold Resource Allocation*, Marcel Fafchamps, December 1998

**54** *Endogeneity of Schooling in the Wage Function: Evidence from the Rural Philippines*, John Maluccio, November 1998

**53** *Agricultural Wages and Food Prices in Egypt: A Governorate-Level Analysis for 1976-1993*, Gaurav Datt and Jennifer Olmsted, November 1998

**52** *Testing Nash Bargaining Household Models With Time-Series Data*, John Hoddinott and Christopher Adam, November 1998

**51** *Urban Challenges to Food and Nutrition Security: A Review of Food Security, Health, and Caregiving in the Cities*, Marie T. Ruel, James L. Garrett, Saul S. Morris, Daniel Maxwell, Arne Oshaug, Patrice Engle, Purnima Menon, Alison Slack, and Lawrence Haddad, October 1998

**50** *Computational Tools for Poverty Measurement and Analysis*, Gaurav Datt, October 1998

**49** *A Profile of Poverty in Egypt: 1997*, Gaurav Datt, Dean Jolliffe, and Manohar Sharma, August 1998.

**48** *Human Capital, Productivity, and Labor Allocation in Rural Pakistan*, Marcel Fafchamps and Agnes R. Quisumbing, July 1998

**47** *Poverty in India and Indian States: An Update*, Gaurav Datt, July 1998

**46** *Impact of Access to Credit on Income and Food Security in Malawi*, Aliou Diagne, July 1998

**45** *Does Urban Agriculture Help Prevent Malnutrition? Evidence from Kampala*, Daniel Maxwell, Carol Levin, and Joanne Csete, June 1998

**44** *Can FAO's Measure of Chronic Undernourishment Be Strengthened?*, Lisa C. Smith, with a *Response* by Logan Naiken, May 1998

**43** *How Reliable Are Group Informant Ratings? A Test of Food Security Rating in Honduras*, Gilles Bergeron, Saul Sutkover Morris, and Juan Manuel Medina Banegas, April 1998

**42** *Farm Productivity and Rural Poverty in India*, Gaurav Datt and Martin Ravallion, March 1998

**41** *The Political Economy of Urban Food Security in Sub-Saharan Africa*, Dan Maxwell, February 1998

**40** *Can Qualitative and Quantitative Methods Serve Complementary Purposes for Policy Research? Evidence from Accra*, Dan Maxwell, January 1998

## FCND DISCUSSION PAPERS

**39** *Whose Education Matters in the Determination of Household Income: Evidence from a Developing Country*, Dean Jolliffe, November 1997

**38** *Systematic Client Consultation in Development: The Case of Food Policy Research in Ghana, India, Kenya, and Mali*, Suresh Chandra Babu, Lynn R. Brown, and Bonnie McClafferty, November 1997

**37** *Why Do Migrants Remit? An Analysis for the Dominican Sierra*, Bénédicte de la Brière, Alain de Janvry, Sylvie Lambert, and Elisabeth Sadoulet, October 1997

**36** *The GAPVU Cash Transfer Program in Mozambique: An assessment*, Gaurav Datt, Ellen Payongayong, James L. Garrett, and Marie Ruel, October 1997

**35** *Market Access by Smallholder Farmers in Malawi: Implications for Technology Adoption, Agricultural Productivity, and Crop Income*, Manfred Zeller, Aliou Diagne, and Charles Mataya, September 1997

**34** *The Impact of Changes in Common Property Resource Management on Intrahousehold Allocation*, Philip Maggs and John Hoddinott, September 1997

**33** *Human Milk—An Invisible Food Resource*, Anne Hatløy and Arne Oshaug, August 1997

**32** *The Determinants of Demand for Micronutrients: An Analysis of Rural Households in Bangladesh*, Howarth E. Bouis and Mary Jane G. Novenario-Reese, August 1997

**31** *Is There an Intrahousehold 'Flypaper Effect'? Evidence from a School Feeding Program*, Hanan Jacoby, August 1997

**30** *Plant Breeding: A Long-Term Strategy for the Control of Zinc Deficiency in Vulnerable Populations*, Marie T. Ruel and Howarth E. Bouis, July 1997

**29** *Gender, Property Rights, and Natural Resources*, Ruth Meinzen-Dick, Lynn R. Brown, Hilary Sims Feldstein, and Agnes R. Quisumbing, May 1997

**28** *Developing a Research and Action Agenda for Examining Urbanization and Caregiving: Examples from Southern and Eastern Africa*, Patrice L. Engle, Purnima Menon, James L. Garrett, and Alison Slack, April 1997

**27** *"Bargaining" and Gender Relations: Within and Beyond the Household*, Bina Agarwal, March 1997

**26** *Why Have Some Indian States Performed Better Than Others at Reducing Rural Poverty?*, Gaurav Datt and Martin Ravallion, March 1997

**25** *Water, Health, and Income: A Review*, John Hoddinott, February 1997

**24** *Child Care Practices Associated with Positive and Negative Nutritional Outcomes for Children in Bangladesh: A Descriptive Analysis*, Shubh K. Kumar Range, Ruchira Naved, and Saroj Bhattarai, February 1997

**23** *Better Rich, or Better There? Grandparent Wealth, Coresidence, and Intrahousehold Allocation*, Agnes R. Quisumbing, January 1997

**22** *Alternative Approaches to Locating the Food Insecure: Qualitative and Quantitative Evidence from South India*, Kimberly Chung, Lawrence Haddad, Jayashree Ramakrishna, and Frank Riely, January 1997

**21** *Livestock Income, Male/Female Animals, and Inequality in Rural Pakistan*, Richard H. Adams, Jr., November 1996

**20** *Macroeconomic Crises and Poverty Monitoring: A Case Study for India*, Gaurav Datt and Martin Ravallion, November 1996

**19** *Food Security and Nutrition Implications of Intrahousehold Bias: A Review of Literature*, Lawrence Haddad, Christine Peña, Chizuru Nishida, Agnes Quisumbing, and Alison Slack, September 1996

**18** *Care and Nutrition: Concepts and Measurement*, Patrice L. Engle, Purnima Menon, and Lawrence Haddad, August 1996

**17** *Remittances, Income Distribution, and Rural Asset Accumulation*, Richard H. Adams, Jr., August 1996

**16** *How Can Safety Nets Do More with Less? General Issues with Some Evidence from Southern Africa*, Lawrence Haddad and Manfred Zeller, July 1996

## FCND DISCUSSION PAPERS

**15** *Repayment Performance in Group-Based credit Programs in Bangladesh: An Empirical Analysis*, Manohar Sharma and Manfred Zeller, July 1996

**14** *Demand for High-Value Secondary Crops in Developing Countries: The Case of Potatoes in Bangladesh and Pakistan*, Howarth E. Bouis and Gregory Scott, May 1996

**13** *Determinants of Repayment Performance in Credit Groups: The Role of Program Design, Intra-Group Risk Pooling, and Social Cohesion in Madagascar*, Manfred Zeller, May 1996

**12** *Child Development: Vulnerability and Resilience*, Patrice L. Engle, Sarah Castle, and Purnima Menon, April 1996

**11** *Rural Financial Policies for Food Security of the Poor: Methodologies for a Multicountry Research Project*, Manfred Zeller, Akhter Ahmed, Suresh Babu, Sumiter Broca, Aliou Diagne, and Manohar Sharma, April 1996

**10** *Women's Economic Advancement Through Agricultural Change: A Review of Donor Experience*, Christine Peña, Patrick Webb, and Lawrence Haddad, February 1996

**09** *Gender and Poverty: New Evidence from 10 Developing Countries*, Agnes R. Quisumbing, Lawrence Haddad, and Christine Peña, December 1995

**08** *Measuring Food Insecurity: The Frequency and Severity of "Coping Strategies,"* Daniel G. Maxwell, December 1995

**07** *A Food Demand System Based on Demand for Characteristics: If There Is "Curvature" in the Slutsky Matrix, What Do the Curves Look Like and Why?*, Howarth E. Bouis, December 1995

**06** *Gender Differentials in Farm Productivity: Implications for Household Efficiency and Agricultural Policy*, Harold Alderman, John Hoddinott, Lawrence Haddad, and Christopher Udry, August 1995

**05** *Gender Differences in Agricultural Productivity: A Survey of Empirical Evidence*, Agnes R. Quisumbing, July 1995

**04** *Market Development and Food Demand in Rural China*, Jikun Huang and Scott Rozelle, June 1995

**03** *The Extended Family and Intrahousehold Allocation: Inheritance and Investments in Children in the Rural Philippines*, Agnes R. Quisumbing, March 1995

**02** *Determinants of Credit Rationing: A Study of Informal Lenders and Formal Credit Groups in Madagascar*, Manfred Zeller, October 1994

**01** *Agricultural Technology and Food Policy to Combat Iron Deficiency in Developing Countries*, Howarth E. Bouis, August 1994