

Household Decisions, Gender, and Development

A SYNTHESIS OF RECENT RESEARCH

edited by Agnes R. Quisumbing



INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE (IFPRI)

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International Food Policy Research Institute
Washington, D.C.

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International Food Policy Research Institute
2033 K Street, NW, Washington, DC 20006-1002, USA
Telephone: +1-202-862-5600; Fax: +1-202-467-4439
www.ifpri.org

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Foreword

It was almost two decades ago that researchers first turned close attention to the policy implications of interactions within households. Until development researchers began untangling the importance of household dynamics, policymakers usually assumed that it was possible to improve a household's welfare by directing a transfer to the husband or the wife—it didn't really matter. Such policies often “inexplicably” failed to achieve their ultimate ends.

This book synthesizes IFPRI's substantial contributions to the study of gender in development policy. IFPRI's work in this area sprang out of a study on how the commercialization of agriculture affected the nutritional status of individuals within households in a number of African and Asian countries in the late 1980s and early 1990s. Although sociologists and anthropologists had long called attention to the possibility that men and women within households had different rights, resources, and responsibilities, this study was one of the first to quantify the effects of women's control of income on household food security and nutrition. The commercialization study was conducted at the same time that the international agricultural research community began to pay attention to gender issues in agriculture. It also coincided with a growing interest from the economics profession in alternative models of household decisionmaking. At that time, testing these models of decisionmaking was difficult because of the lack of data on individual outcomes. Because IFPRI's commercialization study looked at individual outcomes (like nutrition and health), the institute was in a good position to be able to test these alternative models empirically.

In the mid-1990s IFPRI launched a full program of research on gender and household decisionmaking. The first phase of the program explored and tested alternative models of decisionmaking using existing data; the output

of this first phase of research by IFPRI and other researchers was published in *Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policy*, edited by Lawrence Haddad, John Hoddinott, and Harold Alderman. The diversity of social structures and policy regimes across countries and cultures, however, made generalizations difficult. Moreover, while researchers could analyze data on individual outcomes, information on the factors affecting an individual's decisionmaking power within the household was scarce. The second phase of IFPRI's research aimed to test household models over a range of conditions and cultures, using comparable data collection and analytical methodologies. The new phase of primary data collection emphasized indicators of men's and women's bargaining power within the household. This phase of the research tackled issues of gender as they affected not only nutrition, but also agriculture and management of natural resources, social capital, and legal institutions and property rights. IFPRI's researchers also examined what kinds of policies could do most to improve the well-being of women and thereby improve conditions for the entire household, especially children.

Household Decisions, Gender, and Development presents an overview of the research findings in these critical areas. In so doing, it offers an up-to-date and timely description of the development community's current understanding of how household decisionmaking affects the welfare of individuals in a range of ways. This new understanding has been the catalyst for a host of innovative public policies for alleviating poverty and hunger, including microfinance directed to women, food for education, child care programs, and integrated health, nutrition, and education programs such as PROGRESA in Mexico, which are analyzed here.

Although there is still much to learn about how men's and women's roles in the household influence development processes, the research presented here has been key in establishing a notion that is fast becoming conventional wisdom: increasing resources in the hands of women is key to improving project performance and attaining many important development outcomes.

Joachim von Braun
Director General
International Food Policy Research Institute

Preface

This book synthesizes IFPRI's research on intrahousehold allocation since the publication of *Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policy*, edited by Lawrence Haddad, John Hoddinott, and Harold Alderman, in 1997. Since the mid-1990s IFPRI's gender and intrahousehold research program has collected primary data to obtain quantifiable, yet culturally relevant, indicators of bargaining power. It has tested alternative models of household decision-making using these data and used a gender perspective in the evaluation of development policies and programs. The research program has generated a wealth of material that has been published in journal articles, research reports, edited volumes, and discussion papers. This volume brings together briefs based on the original material, highlights the contributions of the individual pieces, and draws out key messages from the varied studies on the issue. It does not attempt to impose a "unitary" view of gender in the development process; rather, it highlights what can be learned from different approaches (both economic and non-economic) in a wide range of countries, looking at issues such as power within the household, agriculture and natural resources, health and nutrition, social norms and institutions, and policies and interventions. Despite the diversity of topics and approaches, common themes emerge from this collection of studies. Thus, this volume would be suitable as an introduction to the literature on gender and development for students and practitioners in the development field. This synthesis does not mean the end of gender and intrahousehold research at IFPRI. Rather, making these research results available to a wider audience represents a transition to a broader and more integrated approach to studying socially generated gender asymmetries in access to opportunity, power,

and assets—in terms of identifying them, analyzing their causes and consequences, and determining what public policy can do to ameliorate them.

This volume draws on the research of many individuals at IFPRI and our collaborating institutions in developing and developed countries. I have been privileged to work with this inspiring and committed group of people for the past eight years. I would like to thank Lawrence Haddad for his guidance throughout the research program and most especially for bringing me to IFPRI to lead it. I am grateful to Per Pinstrup-Andersen and Joachim von Braun for the institute's wholehearted support for this research, and to Klaus von Grebmer, who first thought of a "reader" as a synthesis volume. The research team is especially grateful to Harold Alderman, Mayra Buvinic, Jennie Dey-Abbas, Dolores Koenig, Jean-Pierre Habicht, Cynthia Lloyd, Barbara MkNelly, Barbara Miller, Beatrice Rogers, T. Paul Schultz, John Strauss, Richard Strickland, and Duncan Thomas, members of the project's External Advisory Committee, for their constructive criticism and counsel through the years. We also received comments from Jere Behrman, Kathy Blakeslee, Michael Carter, David Gimball, Peter Hazell, Jane Hopkins, Alain de Janvry, Emmanuel Jimenez, Cate Johnson, Elizabeth King, Virginia Lambert, Margaret Lycette, Andy Mason, Rajul Pandya-Lorch, Per Pinstrup-Andersen, Deborah Rubin, Elisabeth Sadoulet, Muneera Saleem-Murdoch, Shirley Toth, Chris Udry, and numerous reviewers of the original research on which this volume is based. An anonymous referee reviewed the present manuscript and offered many useful suggestions. Lynn Brown and Hilary Sims Feldstein helped shape the program in its early days. Ellen Payongayong and Oscar Neidecker-Gonzales provided excellent research support, while Marie Hoffman, Christina Quintos, and Lourdes Hinayon coordinated the numerous activities of the team and its collaborators. Jay Willis provided word processing, Heidi Fritschel edited the manuscript, and Uday Mohan managed the editing and production of the manuscript.

Because empirical research on intrahousehold issues is not cheap, we have been fortunate to have donors who were equally committed to studying gender issues in order to improve development policy. Most of the empirical research was funded by the U.S. Agency for International Development, Office of Women in Development, Grant No. FAO-0100-G-00-5020-00, "Strengthening Development Policy through Gender Analysis: An Integrated Multicountry Research Program." The AID grant funded primary data collection in Bangladesh, Ethiopia, Guatemala, and South Africa and supported the work of our collaborators in Ecuador, Ghana, Indonesia, Nepal, the Philippines, and Zimbabwe. The Ghana and Indonesia (Sumatra) studies were funded under a grant from the Department for International Development, United Kingdom. Other donors that contributed to the

research undertaken under the multicountry program were the Danish International Development Agency (Danida), the Government of Japan, the Government of Mexico, the Swedish International Development Agency (Sida), the World Health Organization, and the World Bank. The Government of Norway provided funds to synthesize the results and to field-test a guide for practitioners in Guatemala, Kenya, and Nepal.

Finally, on behalf of IFPRI's gender and intrahousehold research team, I would like to thank the many men and women who welcomed us into their homes and patiently spent many hours answering questions, so that we would better understand their lives, their joys and hardships, and their hopes for their children.

What Have We Learned from Research on Intrahousehold Allocation?

Agnes R. Quisumbing

Many decisions that affect the well-being of individuals are made within families or households. The processes by which resources are allocated among individuals and the outcomes of those processes are commonly referred to as “intrahousehold resource allocation.” Since the early 1990s a growing literature has paid increasing attention to the role that intrahousehold resource allocation plays in affecting the outcome of development policy (see Strauss and Thomas 1995; Behrman 1997; Haddad, Hoddinott, and Alderman 1997 for reviews). This literature questions the traditional view that individuals within the household share the same preferences or pool their resources. The literature also recognizes that rights, resources, and responsibilities of household members—especially men and women—may be different.

If household members in fact have different preferences, resources, and responsibilities, then designing policies while relying on a model of the household that assumes that individuals share the same preferences and pool their resources—the unitary model—may lead to policy failures (Haddad, Hoddinott, and Alderman 1997). The effect of public transfers may differ depending on the identity of the income recipient. Households may reallocate resources away from the transfer recipient to compensate for the transfer receipt. Policy initiatives and information addressed to one person in the household may not be shared with other household members. And assuming that households act as one disables many policy levers that could be brought to bear on development problems.

Despite increasing evidence rejecting the unitary model, the body of research from which generalizations can be drawn is limited. Few studies

have been replicated over a range of conditions and cultures (Haddad, Hoddinott, and Alderman 1997). Other factors besides policy clearly affect intrahousehold allocation, such as the extended family, community, and other social groups. More important, existing empirical work in economics may not adequately capture the specific cultural contexts in which individuals within households and families make decisions.

The main objective of this book is to synthesize new knowledge on intrahousehold allocation, drawing from the gender and intrahousehold research program of the International Food Policy Research Institute (IFPRI) and based on specially designed household surveys in developing countries. In four of these countries—Bangladesh, Ethiopia, Guatemala, and South Africa—data sets were specifically designed to examine intrahousehold allocation and household decisionmaking, drawing on qualitative information to create culturally specific but quantifiable indicators of factors that affect household decisionmaking. In these “high-concentration” countries, IFPRI researchers used a common framework and similar methodologies to analyze a wide range of policy issues, permitting comparisons across countries. In other countries, modules on intrahousehold allocation and gender were added to ongoing or planned studies by IFPRI researchers and their collaborators. In most, but not all, of these countries, researchers made an explicit effort to test the unitary model of household behavior against an alternative that allowed for different preferences of household members and nonpooling of household resources. This volume therefore represents where IFPRI’s research program on intrahousehold issues has gone since the publication of Haddad, Hoddinott, and Alderman’s *Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policy* (1997).

This volume is designed to give development students and practitioners an overview of new research on the role of gender in household decisionmaking and development processes. It consists of a series of briefs, or chapters, based on the original research, and its focus is on results and policy implications; the interested reader may refer to the original papers cited in a footnote at the beginning of each chapter for more details on theory and methodology. The chapters are organized according to the following broad themes: (1) power and resources within the household; (2) agriculture and natural resources; (3) health and nutrition; (4) social capital, legal institutions, and property rights; and (5) the impact of policies and interventions. Each section begins with an overview chapter that describes the specific contribution of each chapter and the key messages on each theme, while each chapter contains a summary of the research.

Context and Rationale

Four factors have contributed to the tremendous growth of research on intrahousehold issues in recent years: (1) the development of new models of household decisionmaking; (2) an increased awareness that paying attention to intrahousehold allocation issues matters in the design and implementation of development policy; (3) the growing availability of data from developing and developed countries with which to test alternative household models; and (4) the use of qualitative methods, arising from increased collaboration with anthropologists and other social scientists, to understand non-economic dimensions of human behavior.

This section briefly reviews these factors to provide the context and rationale for the recent research.

Development of New Models of Household Behavior

Economists have increasingly questioned the traditional model of household behavior and proposed alternative models that bear closer resemblance to reality (see Haddad, Hoddinott, and Alderman 1997 for a review of these models).¹ Most economists see the household as a collection of individuals who behave as if they agree on how best to combine time, goods purchased in the market, and goods produced at home to produce commodities that maximize some common welfare index. This approach is appealing because of its relative simplicity and the diversity of issues it can address—such as the determinants of education, health, fertility, divorce, migration, labor supply, home production, land tenure, and crop adoption (see Becker 1973). It is

¹Many of these challenges came from studies in the 1980s that suggested that men and women spend income under their control in systematically different ways. These studies included Guyer (1980); Tripp (1982); Pahl (1983); and studies from different countries (for example, Fapohunda 1988) in the volume edited by Dwyer and Bruce (1988). A series of studies on agricultural commercialization and nutrition in developing countries also found that female-controlled income is more likely than male-controlled income to be spent on food (Kennedy 1994). Evidence that men and women may have different production priorities can be found in the work of Dey (1985) on irrigated rice in The Gambia; Jones's (1983) formal model of intrahousehold conflict and husband's and wife's gains from cooperation based on work in the Cameroon; Mukhopadhyay's (1984) decision model of the sexual division of labor for household tasks; Hill's (1963, 1978) description of Fante women's entrepreneurial behavior; and Gladwin's (1975, 1982) models of women's marketing and farming decisions. Implications of these differences for project design are discussed by Cloud (1983). These and other studies from Sub-Saharan Africa are reviewed in Gladwin and Macmillan (1989).

called the unitary model because this label describes the household acting as one, with a single preference function. The existence of a single household welfare function reflecting the preferences of all members is not an innocuous assumption, however. If individual household members have different preferences, then these differing preferences must be aggregated in some fashion; the social choice literature illustrates the theoretical difficulties associated with this. Moreover, although the unitary approach allows person-specific prices, it assumes that all household resources (income, capital, labor, and land) are pooled. If preferences are not common to all household members, at least one household member must have the ability to monitor the others and to sanction those who fall foul of the household's rules, an issue of information flows as well as control.

Concerns regarding the assumptions underlying the unitary model have spawned a number of alternatives that weaken those assumptions and focus on the individuality of household members and the possible differences in their preferences. One class of these is the so-called collective models (Chiappori 1988, 1992, 1997) that allow differing preferences and only assume that allocations are made in such a fashion that the outcomes are Pareto optimal or Pareto efficient. That is, an individual within the household can only be made better-off at the expense of another household member.

All collective models have two common features: first, they allow different decisionmakers in the household to have different preferences, and, second, they do not require a unique household welfare index to be interpreted as a utility function, thereby allowing the index to be dependent on prices and incomes as well as "tastes" (Chiappori 1992). As a consequence, both unitary and collective models permit existing intrahousehold resource allocation rules to affect household responses to public policy. Although both models allow public policy to change intrahousehold allocations of a good, however, only the collective model permits public policy to affect the *rules* of intrahousehold allocation. In the collective model as described, nothing is assumed a priori about the nature of the decision process; that is, it does not directly address the question of how individual preferences lead to a collective choice. If one is willing to put more structure on the decisionmaking process, two subclasses of collective models emerge, one rooted in cooperative and the other in noncooperative game theory.

In the cooperative approach, individuals have a choice of remaining single or of forming a household or other grouping. They choose the latter option when the advantages associated with being in a household outweigh those

derived from being single.² The existence of the household generates a surplus, which will be distributed among its members; the rule governing this distribution is the central issue of the analysis. Unitary models represent a special case of cooperative collective models where preferences are identical and, as a consequence, resources are pooled.

Within the cooperative subclass are examples that represent household decisions as the outcome of some bargaining process applying the tools of cooperative game theory. Casting allocation among household members as a bargaining problem, Manser and Brown (1980) and McElroy and Horney (1981) have emphasized the influence that outside options (also called “exit options” or “threat points”) are likely to have on spouses’ bargaining power and hence on intrahousehold welfare. If this approach is correct, one may hope to affect intrahousehold welfare by improving the exit options of disadvantaged groups. To be successful, however, one must first identify the relevant exit options. The literature has proposed two main categories of outside options: (1) noncooperation within an existing household—the so-called “separate spheres” hypothesis of Lundberg and Pollack (1993); and (2) separation from the household—the exit option that forms the basis of the work of Manser and Brown (1980) and McElroy and Horney (1981).³ These exit options are themselves a function of extra environmental parameters (EEPs) such as laws concerning access to common property and prohibitions on women working outside the home (McElroy 1990). The vast majority of bargaining models rely on a Nash solution (Nash 1953).

The second subclass of collective models relies on noncooperative game theory. While all cooperative models are Pareto efficient, only some noncooperative models are; noncooperative models that do not lead to Pareto-efficient outcomes would therefore not be included in the class of collective models.

The noncooperative approach (Ulph 1988; Kanbur 1991; Lundberg and Pollak 1993; Carter and Katz 1997) relies on the assumption that individuals

²The distribution of gains within marriage is a common application of cooperative models. It is possible, however, that individuals (particularly females) may not have a choice about getting married or forming a household. One can argue that in many contexts the decision to marry or form a new household may be motivated by non-economic factors, such as society’s views of individuals who do not marry.

³Fafchamps (2001) argues that the two should be treated simultaneously. Indeed, the threat of noncooperation need not be credible if the spouse can credibly retaliate by leaving the household.

cannot enter into binding and enforceable contracts with each other. Instead, an individual's actions are conditional on the actions of others. This conditionality of action implies that not all noncooperative models are Pareto optimal—that is, a redistribution of resources from one household member to another could still improve overall welfare. These models assume that individuals within the household not only have differing preferences, but also act as autonomous subeconomies. In these models the household is depicted as a site of largely separate gender-specific economies linked by reciprocal claims on members' income, land, goods, and labor. Net transfers of income between individuals are the only link between them. Thus, when making decisions, each person takes net transfers as given and chooses the goods that he or she will consume to maximize individual utility, rather than the utility of the household unit. Since differential allocations across household members are consistent with both unitary and collective models, the empirical challenge lies in testing whether or not such differentials are consistent with a unitary model of the household or with a decisionmaking process in which different household members have different preferences and varying abilities to enforce these. If the unitary model does not hold, then policymakers have additional levers with which to influence intrahousehold outcomes.

Relevance of Intrahousehold Issues to Policy

As already mentioned, using the unitary model of the household as a guideline for policy prescriptions may lead to four types of policy failures. First, the effect of public transfers may differ depending on the identity of the income recipient. If transfers directed to the husband or the wife have different impacts, for example, targeting transfers to the household may not result in the desired outcomes. Second, public transfers may affect the behavior of nonrecipients of the income transfer. If households reallocate resources away from the transfer recipient to compensate for the transfer receipt, the intended effect of the income transfer may not be realized. For example, suppose that a state introduces a public social security scheme that taxes the young and subsidizes the old, leaving aggregate income unchanged. This scheme might lead to a reduction in private urban-rural remittances from the young to the old, with consumption by individual members unchanged. Third, at the project level, the unitary model predicts that it does not matter to whom policy initiatives are addressed, since information, like other resources within the household, will be shared. Numerous examples, however, many from Sub-Saharan Africa, have shown that targeting one individual rather than the other has led to non-adoption of

particular policies or to unintended consequences of policies adopted. Lastly, adherence to a unitary model of the household eliminates many potential solutions to development problems. The unitary model predicts that household behavior can be changed only by changes in prices and household incomes. In contrast, the collective model posits that a large range of policies can be used to affect household allocation outcomes, such as changes in access to common property resources, credit, public works schemes, and legal and institutional rights.

Policymakers have used the findings from intrahousehold research to design programs that aim to change household behavior by transferring income directly into the hands of women, as illustrated by Mexico's *Programa Nacional de Educación, Salud y Alimentación* (PROGRESA) (National Program for Education, Health, and Nutrition, discussed in Chapters 29 and 30). The receptiveness of policymakers to designing and implementing such programs, as well as to using experimental or quasi-experimental methods of evaluation, has increased our understanding not only of how households make decisions, but also of how policy can affect those decisions. Moreover, the success of microcredit programs targeted to women, exemplified by the Grameen Bank in Bangladesh, has stimulated a new generation of projects that target technologies to women, as discussed in the Bangladesh case study in Chapters 10 to 13. As more interventions are designed that address intrahousehold issues, one hopes for a stronger interaction between policy and research, and more effective programs and policies.

Availability of Disaggregated Household Data

The “explosion” in both the quantity and quality of household- and individual-level data (Strauss and Thomas 1995) has contributed to the growing empirical literature on intrahousehold allocation. Although national statistical agencies have been collecting nationally representative data since after World War II, it is only relatively recently that these data sets have permitted the analysis of intrahousehold issues. The development of the household economics approach (Becker 1973) prompted the design of household surveys that collected data suited to the application of the household production approach.⁴ Some of these innovative surveys

⁴Strauss and Thomas's (1995) review cites the following early examples: the Additional Rural Incomes Survey (ARIS) fielded by the National Council of Applied Economic Research (NCAER) in India; the Malaysian Family Life Survey, fielded by RAND; the RAND–Institute for Nutrition in Central America and Panama (INCAP) surveys in Guatemala, and a series of linked household cross-sectional surveys in Laguna Province, Philippines (Evenson 1978).

undertaken in the 1960s and 1970s, such as the Malaysian Family Life Survey in 1976–77, as well as the first Living Standards Measurement Surveys (LSMS) in Peru and Côte d'Ivoire in 1985, have influenced the design and implementation of subsequent surveys. An important innovation in the LSMS is the integration of household budget data in a broad-purpose sociodemographic survey, allowing for the analysis of individual-level outcomes as well as household consumption and savings decisions. A growing number of surveys now include individual-level outcomes as well as a wealth of information on economic variables. This change has certainly contributed to the growing literature testing the unitary model of the household in a variety of developing- and developed-country situations.

Another stimulus to the collection of gender-disaggregated data came from farming systems research. Researchers working on gender issues in agriculture have often blamed the lack of gender-disaggregated data for the underestimation of women's contribution to agricultural production (Dixon 1982). A collection of papers on farming systems research in Africa, Asia, and Latin America (Poats, Schmink, and Spring 1988) argued convincingly for the collection of gender-disaggregated data and proposed methodologies for collecting such data for farming systems research and extension. Most of the data derived from this approach are not based on nationally representative sampling frames but can be treated as complementary to large-scale household surveys because of the detail they provide at the farm and even the plot level.

New data sets have also become available as a result of program evaluations—PROGRESA is one such example. Where programs are designed to affect individual outcomes such as health, nutrition, or education, evaluations of such programs will naturally collect individual-level, and thus, gender-disaggregated, indicators. Multiple survey rounds undertaken for monitoring purposes also yield panel data sets for future analysis.

Although the evidence rejecting the unitary model is growing, the body of research from which generalizations can be drawn has been limited. Since the diversity of social structures makes generalizations difficult, few studies have been replicated over a range of conditions and cultures (Haddad, Hoddinott, and Alderman 1997). One could question, for example, whether the results of these studies are invariant to the policy regime the household faces. Moreover, there are clearly other factors that affect intrahousehold allocation, such as the existence of extended family, community, and other social groups. More important, it is worth asking whether existing empirical work in economics adequately captures the specific cultural contexts in

which individuals within households and families make decisions. Most household surveys, while collecting information on individual outcomes, often are not designed to collect data with which to characterize decisionmaking processes.

Qualitative Methods and the Contributions of Other Social Sciences

Qualitative methods have contributed new tools and perspectives to the new generation of intrahousehold research. Anthropologists and other social scientists have long challenged the unitary view of household behavior (see, for example, the papers in Dwyer and Bruce 1988). The non-economics social sciences have also long studied the other factors that affect intrahousehold allocation in different cultural contexts. All four high-concentration studies included a parallel qualitative study, although the timing of the study in reference to the survey rounds differed across countries. Qualitative studies were also undertaken in a number of the other countries.⁵

What have qualitative methods contributed to the study of intrahousehold issues? Qualitative data denote the presence or absence of a characteristic, unlike quantitative data that measure the degree to which the feature is present (Chung 2000, 337). Qualitative data are usually collected by means of repeated, intensive interviews with a small number of respondents in their natural environment. These studies have contributed to the research process by helping researchers gain a broad understanding of the culture and community at the outset, for purposes of identifying important features affecting the research questions. Using qualitative techniques before the first round of the quantitative survey has helped generate hypotheses to be tested;

⁵A set of 15 village studies (Bevan and Pankhurst 1996) using qualitative methods was undertaken by anthropology students from Addis Ababa University in all our Ethiopian sites, about the same time that the three-round panel survey was conducted in 1994/95. The 1997 survey drew heavily from the qualitative studies. In Bangladesh a qualitative study on the gender impact of new agricultural technology (Naved 2000, Chapter 12, this volume) was conducted between the third and fourth survey rounds. A study on shocks and coping behavior in South Africa was conducted by an anthropologist before the second round of the panel survey in KwaZulu Natal (Cross, Mngadi, and Mbhele 1998). In Guatemala a qualitative study and an operations research evaluation of the community day-care centers were conducted before the quantitative survey (Ruel 2000). Qualitative studies were also conducted in Indonesia (Frankenberg and Thomas, Chapter 4) and Mexico (Adato et al., Chapter 30).

improved the language and relevance of survey questions, and helped researchers employ codes and categories that reflect “local domains.” This practice has had the added benefit of building rapport with community members to learn about local perceptions and to incorporate these definitions into the survey questionnaire.

Qualitative methods have also helped researchers to use concepts defined by the respondent, or within the respondent’s culture, such as the concept of a “household,” the multiple meanings of income, assets, expenditures, gifts, food, dowries, and inheritance, among others. The focus on assets at marriage in the IFPRI research, for example, reflects the contributions of Guyer (1997) as well as our findings in the field. The iterative nature of qualitative research, plus the respect given to “emic” constructs, has helped researchers modify their research questions and even their approach to the issues (Gittelsohn and Mookherji 1997).⁶ Qualitative methods have also helped operationalize constructs into measurable variables. One basic choice, for example, is whether to retain an emic perspective in this process (using locally determined definitions) or to recast the constructs into the etic perspective of economics or any other discipline. For purposes of comparability, we mapped many emic concepts into their corresponding etic terms—for example, when we used lists of assets at marriage suggested by the qualitative work to draw up a quantitative survey module that then elicited information on both the quantity and values of assets at marriage from respondents.

By returning to the field with interim model results between rounds of the quantitative survey, the research team was able to confirm, modify, extend, or reject some of the interim conclusions and interpretations. This process enabled the research team to refine the quantitative questionnaire and introduce new quantitative modules in later rounds if necessary, as we did in our high-concentration studies. Finally, qualitative studies have provided a way to validate the quantitative results. By providing general and specific insights into the study communities and culture, the qualitative study has facilitated the interpretation of model results (see, for example, Adato et al., Chapter 30).

⁶Anthropologists distinguish between two ways of looking at human beliefs and behaviors: etically and emically. These distinctions were first introduced by anthropological linguist Kenneth Pike (1967) and debated by Harris (1979). “Etic” refers to the interpretations of human beliefs and behaviors from the outsider’s (the investigator’s) point of view, whereas “emic” refers to the interpretation from the insider’s (the respondent’s) perspective.

Key Findings

The IFPRI intrahousehold research program has produced the following key findings:

1. Households do not act as one when making decisions. In an overwhelming majority of cases, we reject the null hypothesis that men and women's resources have the same effects on household decisionmaking. Our results thus support a nonunitary model of household behavior.
2. The collective model predicts that the distribution of resources depends on an individual's bargaining power within the household. The distribution of power and resources within the household, however, almost always favors men. The inequality in resource distribution between men and women has both economic and social consequences, although the specific consequences will differ across countries and cultures.
3. Increasing the resources controlled by women has beneficial effects in a number of areas. In agriculture, a redistribution of resources in favor of women increases yields or leaves them unchanged, meaning that equity gains can be achieved without sacrificing efficiency. Improvements in women's status and increases in the resources that women control raise allocations toward education and improve child health and nutrition. Social networks may also be an important resource that women can use to help mitigate the impact of adverse shocks. Lastly, investment in women, particularly in education, is key to poverty reduction and improved incomes for families as a whole.
4. Protecting women's entitlements implies that their rights should be enforced. Enforcement is not automatic when customary rights and statutory rights are not consistent. Despite legal reform, what often matters is how laws are interpreted and implemented at the local level. Local custom, however, can evolve in response to changing economic incentives.
5. A new generation of policies and programs has explored innovative ways to increase resources in the hands of women. These initiatives include credit programs targeted to women, programs designed to increase girls' educational attainment, community day-care programs, and income transfers targeted to women, among others. These programs have had positive effects on women's earnings and decisionmaking ability, as well as on child nutrition and educational outcomes.

This section reviews these findings in more detail.

Differential Effects of Men's and Women's Resources

Application of a common methodological framework to a number of countries provides further evidence to reject the unitary model of the household, whether outcomes are at the household level (Quisumbing and Maluccio, Chapter 3), the plot level (Alderman et al., Chapter 8), or the individual level (Quisumbing and Maluccio, Chapter 3; Smith et al., Chapter 6; Hallman, Chapter 17; Adato et al., Chapter 30). The rejection of the unitary model has implications for the design of policies designed to transfer resources to households: the identity of the transfer recipient does affect the ultimate outcome of the intervention. Across countries, the most consistent effect is that relative resources controlled by women tend to increase expenditure shares on education, but the mechanisms through which men's and women's resources affect individual outcomes differ substantially across the case studies. The differential effect of parental resources on children of different genders provides further evidence that households in developing countries are not operating within a unitary framework.

The Distribution of Power and Resources within the Household

The collective model predicts that bargaining power determines the share of resources allocated to an individual within the household. Although the concept of bargaining power is elusive, there has been progress in measuring some of the determinants of bargaining power. The chapters in Part 1 explore different dimensions of measuring bargaining power within the household: assets at marriage (Quisumbing and Maluccio, Chapter 3), spheres of decisionmaking (Frankenberg and Thomas, Chapter 4), divorce law (Adam, Hoddinott, and Ligon, Chapter 5), and relative status within the household and within society (Smith et al., Chapter 6).

Regardless of the measure chosen, the distribution of power and resources within the household almost always favors men. In four countries—Bangladesh, Ethiopia, Indonesia (Sumatra), and South Africa—Quisumbing and Maluccio find that men bring more assets to marriage, in terms of both physical and human capital, than do women. Smith et al. use data from 40 Demographic and Health Surveys in developing countries to construct an index of women's relative decisionmaking power within the household and of societal gender inequality. They find that women tend to be less educated than their husbands, with the difference being greatest in South Asia and the smallest in Latin America. Women marry at younger ages in South Asia and at older ages in Latin America. Differences in the preferred numbers of girls

and boys by region are similarly largest in South Asia and smallest in Latin America, and it is also in South Asia where boys are most preferentially treated with respect to preventive health care. This evidence suggests that son preference may be greater in countries where women have lower status. Based on these measures, Smith et al. ranked countries in terms of women's decisionmaking power and societal gender inequality. Women have the lowest status in South Asia, followed by Sub-Saharan Africa, and then Latin America and the Caribbean.

Gains from Increasing Women's Control of Resources

If the unitary model of the household is correct and all resources are pooled, then the issue of whether the man or the woman controls household resources would be irrelevant. The chapters in this book, however, show not only that the effects of men's and women's control over resources differ, but also that increasing women's control of resources or decisionmaking power has favorable effects on a number of important outcomes, such as education, child nutrition, and women's own well-being. Reducing inequalities in human capital, physical capital, and current inputs between male and women farmers in Sub-Saharan Africa has the potential to increase agricultural productivity by 10–20 percent (Alderman et al., Chapter 8). The greater a woman's asset holdings at marriage, the larger is the share the household spends on children's education (Quisumbing and Maluccio, Chapter 3). In Bangladesh a higher share of women's assets is associated with better health outcomes for girls (Hallman, Chapter 17). And improvements in women's decisionmaking power within the family and society can significantly reduce child malnutrition rates (Smith et al., Chapter 6).

Women may invest in other forms of capital besides physical assets. Social capital—features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit—differs across men and women. Evidence from South Africa suggests that women's social capital networks are wider than men's but mobilize fewer resources. Women's contacts also tend to be among women, and men's among men. Returns to men's and women's social capital appear to be identical in terms of their effects on household welfare (proxied by per capita expenditure), although household welfare is more responsive to women's social capital because of the higher level of women's participation in groups (Maluccio, Thomas, and Haddad, Chapter 18).

Finally, investment in women's education has among the farthest-reaching effects. One of the biggest sources of agricultural productivity increases could lie simply in providing universal primary schooling to women

in Sub-Saharan Africa; simulations using data from women farmers in Kenya suggest that yields could be increased by 25 percent if all women attended primary school (see Chapter 7). An earlier study by Smith and Haddad (2000) using cross-country data found that increases in women's education have made the greatest contribution to reducing the rate of child malnutrition, being responsible for 43 percent of the total reduction. Improvements in women's status, proxied by the ratio of female to male life expectancy, make up 12 percent. Improvements in food availability came in a distant second to women's education, contributing 26 percent to the reduction rate. Where women do not face barriers to nonfarm employment, investments in girls' schooling result in higher probabilities of employment in the nonagricultural sector and higher lifetime incomes (Quisumbing, Estudillo, and Otsuka, Chapter 33). Where such barriers exist, the returns to women's education in rural areas will remain low, further dampening parental incentives to invest in girls' education. Programs that provide income transfers to increase girls' school attendance may have far-reaching effects on women's status by equalizing women's and men's human capital. There may be added benefits as well: in Bangladesh, there is some evidence that the Food for Education Program led to delayed marriage, with important implications for women's life opportunities (Arends-Kuenning and Amin 1998, cited in Smith et al., Chapter 26).

Protecting Women's Rights to Property and Other Resources

In the last 20 years, the gender gap has been closing in many areas. Improvements have been greatest in increasing opportunities to invest in and make use of human capital but smallest in assuring women's rights to property and other forms of natural and physical capital. Legal and institutional frameworks provide the basis for women to legitimately lay claim to all these types of assets. Property rights are especially important in determining women's fallback options should they be divorced or widowed—and indirectly, their bargaining power within marriage. In Ethiopia, for example, the share of household assets—land and livestock—that a woman brings to marriage is a key determinant of her share should the marriage end in divorce (Fafchamps and Quisumbing, Chapter 23). Moreover, whereas many countries have promulgated statutory laws to reform discriminatory customary practices, they have often had unintended effects or were never implemented. If women are poor and uneducated, they may not be aware of the provisions of the law.

New crops and technologies that increase the demand for women's labor in agriculture may improve their bargaining power and strengthen their claim

over land, as illustrated by the experience of cocoa farmers in western Ghana (Quisumbing et al. 2001a, also see Chapter 24). Such trends can be supported by legislation that strengthens women's land rights. Men and women should be equally qualified to acquire land titles. Women also need to be made aware of their legal rights and empowered to claim them. Attempts to increase women's incomes or agricultural productivity, however, by equalizing land rights of men and women will succeed only if other constraints faced by women, such as lack of access to credit and other inputs, limited access to extension services, and low levels of education, are also addressed.

Programs and Policies to Increase Women's Resources

Public policies to increase women's resources and improve women's status are of two types: (1) policies that aim to eradicate discrimination and (2) policies that promote more active "catch-up" in women's status by explicitly targeting women (Smith et al., Chapter 26). Evaluations of the latter type of program have shown that they can be effective in improving not only woman-specific outcomes such as earnings (Ruel et al., Chapter 31) and decisionmaking power and status within the household (Adato et al., Chapter 30), but also child-specific outcomes such as diet (Ruel et al., Chapter 31), child nutrition, and a whole range of other outcomes (Skoufias and McClafferty, Chapter 29). Moreover, unless evaluations are undertaken with a broad set of outcome indicators and deliberately elicit participants' own views, it is easy to conclude that the success of programs targeting women is limited, when the true impact of the intervention was on a process that evaluators did not intend to measure. For example, the evaluation of the technology transfer programs in Bangladesh found only modest contributions to household income (Bouis, Chapter 10). But it was not the vegetable technology package but credit from the nongovernmental organization (NGO) that increased women's bargaining power within the household; opportunities to earn income outside the home strengthened women's position in society and the community (Naved, Chapter 12). In the evaluation of a large income-transfer program in Mexico (Adato et al., Chapter 30), the findings from the qualitative study were essential to correct interpretation of the results from the quantitative study. The changes brought about by the program were too subtle to be captured fully by the quantitative questionnaire, even if the quantitative analysis found that the program significantly affected couples' decisionmaking in a few key areas. At the same time policymakers need to be aware of the unintended consequences of interventions—impact on time use and child care, for example (Paolisso et al., Chapter 14; Cooke St. Clair,

Chapter 15)—that may result even from an intervention that was designed with intrahousehold allocation processes in mind.

The effects of public policies to eliminate discrimination are more difficult to evaluate over the short term. A longer-term perspective is essential. A study that tracked gender differences in land inheritance and education over three generations in Ghana, the Philippines, and Sumatra shows that, over the long term, policies to eradicate discrimination may increase lifetime incomes for women and provide benefits to their families (Quisumbing, Estudillo, and Otsuka 2002, Chapter 33). As more panel data sets become available, researchers and policymakers will be able to examine the extent to which reducing gender inequalities has enabled individuals and households to improve their well-being over time. The future holds much potential for further work along these lines.

PART 1

Power and Resources within the Household

Power and Resources within the Household: Overview

Agnes R. Quisumbing

The collective model of the household predicts that bargaining power determines the share of resources allocated to an individual within the household. The concept of bargaining power is elusive, however. It is perhaps useful at this point to outline the possible determinants of bargaining power, while not making any claims to measure power itself. Bargaining power is affected by four sets of determinants: (1) control over resources, such as assets; (2) factors that can be used to influence the bargaining process; (3) mobilization of interpersonal networks; and (4) basic attitudinal attributes.

Economic analysis of bargaining power has tended to focus on economic resources exogenous to labor supply as a major determinant of bargaining power. These include assets (for example, Quisumbing 1994; Doss 1996; Thomas, Contreras, and Frankenberg 1997), unearned income (Schultz 1990; Thomas 1990), or transfer payments and welfare receipts (Lundberg, Pollak, and Wales 1997; Rubalcava and Thomas 1997). The threat of withdrawing both oneself and one's assets from the household grants the owner of those assets some power over household resources. These threats are credible if supported by community norms or divorce laws. Indeed, Thomas, Contreras, and Frankenberg (1997) use assets at marriage as an indicator of bargaining power because in most of Indonesia, spouses can take what they brought into the marriage with them were the marriage to dissolve.

Factors that can influence the bargaining process include legal rights, skills and knowledge, the capacity to acquire information, education, and bargaining skills. Some of these influences are external to the individual (for example, legal rights), but many of them are highly correlated with human

capital or education. In some instances, domestic violence can be used to extract resources from spouses or their families, as in the case of dowry-related violence in India (Rao 1997; Bloch and Rao 2002). Individuals can also mobilize personal networks to improve their bargaining power. Membership in organizations, access to kin and other social networks, and social capital may positively influence a person's power to affect household decisions. Lastly, basic attitudinal attributes that affect bargaining power include self-esteem, self-confidence, and emotional satisfaction. While the economic literature has not dealt extensively with this issue, part of the success of group-based credit programs such as the Grameen Bank has been attributed to its group-based empowerment approach. Many nongovernmental organizations (NGOs) have explicit empowerment objectives that go beyond economic means to include legal awareness, political participation, and use of contraception (Schuler, Hashemi, and Riley 1997).

The chapters in Part 2 take the measurement of power within the household further by applying different methodologies in very different country settings. Chapter 3 uses assets at marriage as a measure of each spouse's bargaining power, based on specially designed household surveys in Bangladesh, Ethiopia, South Africa, and Sumatra (Indonesia). Chapter 4 examines the determinants of a couple's spheres of decisionmaking using new modules in the Indonesian Family Life Survey. Chapter 5 uses changes in Canadian laws regarding the disposition of assets upon divorce as an example of exogenous changes that affect women's fallback options, and Chapter 6 constructs indexes of women's status within the household and the community based on various indicators of women's decisionmaking from 40 countries covered by the Demographic and Health Surveys.

Contributions of Each Chapter

The following three chapters revolve around the measurement of power within the household in a variety of country settings. The chapters also examine the implications of the distribution of power within the household on a number of outcomes: expenditure allocations; children's education; decisions regarding money, expenditures, and time use; and child nutrition.

The chapter by Quisumbing and Maluccio uses a single methodological framework to test the unitary model of household decisionmaking in four countries with very different social and economic conditions (Bangladesh, Ethiopia, Indonesia, and South Africa). The indicator of bargaining power used is assets at marriage of husband and wife, collected using specially-

designed household surveys. Effects of assets at marriage are evaluated using both household-level outcomes (expenditure shares) and individual-level outcomes (years of schooling and deviation from cohort means). Results support the rejection of the unitary model. Higher relative resources controlled by women tend to increase education budget shares. The impact on individual schooling outcomes also supports the rejection of the unitary model, but the patterns underlying the results differ across the case studies, an outcome that could be due to different patterns of old-age support by children.

Frankenberg and Thomas (Chapter 4) used focus groups of men and women to develop modules on household decisionmaking that were fielded in the second round of the Indonesian Family Life Survey. Couples' decisionmaking was studied in three areas: (1) decisionmaking regarding the use of one's own and one's spouse's money, (2) decisionmaking about expenditures and time use, and (3) relative status of husband and wife within the household. Decisionmaking regarding money was influenced by ethnicity, education, and perceptions of family status, although the effects were different for husband and wife. Decisionmaking about expenditures and time use was very heterogeneous across respondents, with wife's education and relative status of spouses among the more important determinants. Finally, conditions of the interview do affect responses given by respondents, and the results suggest that collecting information about couples in surveys on an individual basis may be quite difficult to do in practice.

Adam, Hoddinott, and Ligon (Chapter 5) investigate the impact of changes in divorce law on the suicide rates of Canadian women between 1960 to 1994. They find that female suicide rates in Ontario declined markedly for older women after divorce laws were amended in 1975 and 1978 to give women an equal interest in the family assets, regardless of who owned the assets or made monetary contributions to acquire them. By contrast, there was no change in suicide rates for younger women. In Quebec, where no legislative changes occurred, no structural break in suicide rates was observed.

Smith et al. (Chapter 6) use data on children under three years of age from 36 developing countries to examine the impact of women's relative status on child malnutrition. Two measures of women's status are used: decisionmaking power within the household and societal gender inequality. Women's status has a significant positive effect on children's nutritional status, with the strongest effect found in South Asia, followed by Sub-Saharan Africa, and the weakest in Latin America and the Caribbean. Two

important contributions of this research are the estimated cost of inequality in terms of child malnutrition and the explicit linkage between women's status and a household's economic status. In both South Asia and Sub-Saharan Africa, it makes sense to target the poorest households for improvements in women's status because it is in these households that both child nutritional status and women's status are lowest.

Key Messages

1. Since power is a multidimensional concept, one needs to look at various dimensions of power and choose those that are relevant in the cultural context. These studies have employed a number of ways to measure power within the household—assets at marriage, spheres of decisionmaking, laws regarding the disposition of property upon divorce, and women's relative status within the household and within society—using both qualitative and quantitative methods.
2. Power within the household is usually linked to the resources—both physical and human—that partners bring to the marriage or with which they can leave it. In most cases women bring fewer resources to the marriage than men. Perceptions of relative status are also important determinants of decisionmaking by couples.
3. The evidence from this set of papers supports a collective model of the household where, given different preferences, intrahousehold allocation outcomes are determined by one's control of resources or bargaining power. Resources in the hands of women (as reflected in more assets at marriage, better education, or higher status) are usually reflected in greater expenditures on children (education, clothing) and better child nutritional outcomes. Differences in bargaining power also affect whether or not household decisions are made jointly or individually.

Intrahousehold Allocation and Gender Relations: New Empirical Evidence from Four Developing Countries

Agnes R. Quisumbing and John A. Maluccio

Most economic research treats the household as a single agent, assuming that individuals within the household share the same preferences or that there is a household “head” who has the final say. This simple framework has proved immensely useful; despite a common misperception, it can explain many differences in well-being or consumption patterns *within* households. Nonetheless, recent empirical research demonstrates that this “unitary” household model is inappropriate in a variety of settings in both developed and developing countries (see Haddad, Hoddinott, and Alderman 1997 for reviews).

Both theoretical concerns and empirical evidence have cast doubt on the unitary model, spawning a variety of alternative models of the household that focus on the individuality of household members. Among these are so-called collective models that allow differing preferences and only assume that allocations result in Pareto-efficient outcomes, where it would not be possible to increase the welfare of one individual without reducing that of another. A common interpretation for collective models is that there is cooperative bargaining within the household. This chapter exploits that interpretation to construct and carry out a test of the unitary household model. The basic insight is that if preferences are different and there is bargaining, household decisions will vary according to the relative strengths of individuals’ bargaining power.

This chapter contains preliminary results found in Quisumbing and Maluccio (2000). For an updated version, see Quisumbing and Maluccio (2003).

Measuring individual bargaining power can be quite difficult, however. Attempts to do so in the economics literature have focused on control over economic resources. Candidate proxies for bargaining power have included (1) public provision of resources to a particular member of the household and exogenous policy changes that affect the intrahousehold distribution of these resources (Lundberg, Pollak, and Wales 1997; Rubalcava and Thomas 1997); (2) shares of income earned by women (Haddad and Hodinott 1994); (3) unearned income (Schultz 1990; Thomas 1990); (4) current assets (Doss 1996); (5) inherited assets (Quisumbing 1994); and (6) assets at marriage (Thomas, Contreras, and Frankenberg 1997). Any of these measures might proxy for bargaining power if, for example, the threat of withdrawing both oneself and one's assets from the household grants the owner of those assets some power over household decisionmaking.

We choose assets at marriage as our indicator of bargaining power for several reasons. First, assets brought to marriage, since they are determined before or at the time of marriage, are not affected by decisions made within marriage, even if they may be influenced by factors that led to this specific couple's being matched (marriage market selection). Second, in many cultures, marriage is one of two key occasions during an individual's lifetime when assets are transferred across generations (the other is the death of the parent). Third, assets transferred at marriage may have a symbolic meaning over and above their economic value. Recognizing the cultural specificity of asset transfers and marriage customs, we designed and pretested survey modules on assets and related transfers at marriage in each of the study countries. In most of the countries, the household survey was informed by a qualitative study (Bangladesh, Ethiopia, South Africa) or by community interviews on marriage customs and transfers at the time of marriage (Sumatra). Using a broad definition of assets at marriage to include human capital, we also treat the educational attainment of each spouse as a proxy for the human capital they each bring to the marriage.

We apply a single methodological framework to test the unitary model in four countries with very different social and economic conditions: Bangladesh, Ethiopia, Indonesia, and South Africa. Applying the common framework to the design and analysis of household surveys while paying attention to country-specific nuances has provided many important insights. For example, although women appear to bring far fewer assets to the marriage (Table 3.1), the role these assets play in household decisionmaking varies substantially across countries.

Specifically, we test whether assets brought to marriage by each spouse have differential effects on household-level and individual-level outcomes.

Table 3.1 Assets at marriage and human capital of husband and wife

	Husband		Wife	
	Mean	Standard deviation	Mean	Standard deviation
Bangladesh				
Assets at marriage (1996 taka)	81,929	145,584	7,064	8,472
Transfers at marriage (1996 taka)	4,053	15,014	5,856	11,646
Years of schooling	3.18	4.03	1.68	2.78
Sumatra				
Area of paddy land (hectares)	0.18	0.3	0.25	0.62
Area of forestry land (hectares)	0.9	1.64	0.42	1.03
Years of schooling	6.83	3.6	6.23	3.4
Ethiopia				
Land and livestock assets at marriage (1997 birr)	2,739	7,188	461	2,023
Total assets at marriage (1997 birr)	4,194	8,272	978	2,424
Years of schooling	1.9	1.9	1.3	1.1
South Africa				
Count of assets at marriage	2.1	1.6	0.72	0.97
Years of schooling	5.22	3.78	5.03	3.53

The household-level outcomes are expenditure shares of food, education, health, children's clothing, and alcohol and/or tobacco.¹ The individual-level outcomes analyzed are two measures of educational attainment: the deviation of the child's completed schooling from the cohort mean, which

¹To test our model using household-level outcomes, we estimate the following expenditure function:

$$w_j = \alpha_j + \beta_{1j} \ln pcexp + \beta_{2j} (\ln pcexp)^2 + \beta_{3j} \ln size + \beta_{4j} \ln A_h + \beta_{5j} \ln A_w + \sum_{k=1}^{K-1} \delta_{kj} dem_k + \sum_{s=1}^S \varphi_{js} z_s + e_j,$$

where w_j is the budget share of the j th good; $\ln pcexp$ is the natural logarithm of total per capita expenditures, and $(\ln pcexp)^2$ is its square; $\ln size$ is the natural log of household size; $\ln A_h$ and $\ln A_w$ are the natural logs of assets owned by the husband and wife, respectively; dem_k is the proportion of demographic group k in the household; z_s is a vector of dummy variables indicating location and survey round; e_j is the error term; and α_j , β_{1j} , β_{2j} , β_{3j} , β_{4j} , δ_{kj} , and φ_{js} are parameters to be estimated. This specification is similar to Thomas and Chen (1994). Controlling for levels of household income (as proxied by per capita expenditure), if the unitary model holds in a static framework, assets of husband and wife should have no effect on allocations, so $\beta_{4j} = \beta_{5j} = 0$. In a more general (for example, dynamic) framework, however, the equality of husband's and wife's effects to zero may not hold. We therefore use a more general version of the test of the unitary model, namely that the difference between the husband's and wife's asset effects is equal to zero.

measures how well the child is doing relative to other children of the same age, and years of schooling completed.²

The results for the expenditure share analysis show that the unitary model of the household is, on the whole, rejected, in all four countries (Table 3.2).

Table 3.2 Signs of coefficients on male and female assets, expenditure share regressions

Indicator	Bangladesh	Indonesia		Ethiopia	South Africa (Africans only)
		Paddy	Forest		
Food share regression					
Wife assets	—	—	—	Positive	—
Husband assets	—	Negative	—	—	—
Wife–husband assets ^a	—	Positive	Positive	Positive	—
Education share regression					
Wife assets	Positive	Positive	—	—	Positive
Husband assets	—	—	Negative	—	—
Wife–husband assets ^a	Positive	—	—	—	Positive
Health share regression					
Wife assets	—	Positive	—	—	—
Husband assets	—	—	—	—	—
Wife–husband assets ^a	Negative	Positive	—	—	—
Child clothing share regression					
Wife assets	Positive	—	—	—	—
Husband assets	—	—	—	—	—
Wife–husband assets ^a	—	—	—	—	—
Alcohol and/or tobacco share regression					
Wife assets	—	—	—	—	—
Husband assets	—	Positive	—	Positive	—
Wife–husband assets ^a	—	Negative	—	Negative	—

Note: Dash indicates not significant.

^aDifference between wife and husband asset coefficients.

²We estimate the child's schooling outcome as a function of child characteristics (gender, age, and age squared) and parental characteristics at the time of marriage: education of the husband and wife and assets at marriage of the husband and wife. That is,

$$E_{ij}^* = \beta_0 + \beta_1 X_{cij} + \beta_2 X_{fj} + \beta_3 X_{mj} + \beta_4 G_{ij} \times X_{fj} + \beta_5 G_{ij} \times X_{mj} + e_{ij}$$

where E_{ij}^* is the educational outcome of child i in family j ; X_c is a vector of child characteristics such as sex, age, and age squared; G is the daughter dummy; X_f and X_m are vectors of exogenous father's and mother's human and physical wealth, respectively; and e_{ij} is the error term in each equation. Following some tests of the unitary model (for example, Quisumbing 1994), which include both human and physical capital as assets brought to marriage, father's and mother's wealth at the time of marriage enter separately into the regressions.

This finding is stronger in the Asian countries than in the African ones, however. Across countries, the most consistent effect is that higher relative resources controlled by women tend to increase the shares spent on education. Although it is tempting to say that mothers are more altruistic than fathers, this behavior may have a sound economic basis. Since women are younger at marriage and expect to live longer, they may invest in the education of their children more heavily since they are more likely to rely on them for old-age support. Furthermore, in societies where key assets that assure lifetime consumption-smoothing are controlled by men, women may attempt to meet the same long-term needs with other instruments, such as investment in the human capital of healthy and educated children.

To explore how the increased resources devoted to education play out in the household, we examine educational outcomes for children. We examine both years of schooling completed and the deviation of the child's schooling from the cohort mean. The second indicator shows how well each child is doing relative to other children of the same age. The results for both schooling outcomes provide further evidence against the unitary model. The patterns underlying the earlier results differ substantially, however, across the case studies.

In both Bangladesh and South Africa, there is evidence that more assets in the hands of women have a positive impact on the educational budget shares. Yet in Bangladesh father's schooling (for the 6- to 10-year-olds) and assets (for the 11- to 15-year-olds) has a negative impact on girls' schooling, whereas in South Africa, it is the opposite. Father's schooling has a positive effect on girls' schooling, whereas mother's assets have a negative impact. In South Africa the pattern may be partly justified using the old-age security hypothesis outlined earlier—mothers favor sons who are more likely to provide for them—but in Bangladesh different preferences are more likely the underlying cause. Wealthier Bangladeshi fathers may attach a higher premium to marrying their daughters off earlier, an effect opposite to that of better-educated mothers.

Nevertheless, programs designed to transfer assets to women should be carefully scrutinized. First, although more assets in the hands of women lead to higher budget shares for education, the beneficiaries of these gains in terms of girls versus boys are different across countries. These differences appear to be driven by both differences in preferences and underlying economic rationales. An understanding of the latter is an important ingredient into policymaking aimed at exploiting these differences. Second, different types of assets may have different implications for bargaining power if "status" or prestige is attached to a particular asset. Indeed, the special meaning or

significance attached to ritual transfers such as dowries or bride price should warn us against asset-transfer interventions that are designed without paying attention to cultural contexts. Lastly, we must also remember the possibility of compensatory (or even retaliatory) action by nonrecipients.

The results also show that influences on intrahousehold allocation are operating at different levels, with different implications for policy. In the Ethiopian case, site-specific characteristics, ethnicity, and religious differences have a stronger effect than husband's or wife's assets. This finding shows that variations across communities and ethnic groups may be larger than variations in the asset position of men and women within those groups. In this case legal reforms that affect property rights across groups might have a larger impact on intrahousehold allocation than redistribution within each group. In the Bangladesh case, on the other hand, differences in asset positions of men and women within sites are large enough to warrant interventions to increase women's assets relative to men's.

Measuring Power

Elizabeth Frankenberg and Duncan Thomas

Much empirical work has approached the problem of how resource allocations are made within households from the perspective that if preferences differ, welfare outcomes depend on the power of individuals to exert their own preferences. Measures of power are therefore a central component of quantitative empirical approaches to understanding how different preferences translate into different welfare outcomes. Following most of the empirical studies in this genre, this chapter focuses on dynamics within couples.

This chapter is about the development of a decisionmaking module as part of a large-scale, multipurpose household survey, the second Indonesia Family Life Survey (IFLS2) (Frankenberg and Thomas 2001). The IFLS2 was fielded in 13 provinces in Indonesia between August 1997 and February 1998. The Indonesia Family Life Survey (IFLS) is an ongoing panel survey, with the potential to provide a picture of the dynamics of power relationships over time and across the life course, an issue about which little is known. This chapter describes the approach we took to developing the household decisionmaking module and presents preliminary results from the IFLS2.

For details see Frankenberg and Thomas (2001).

Approach

The IFLS is a multipurpose panel survey of more than 7,000 households in Indonesia. The first round was conducted in 1993/94. In the second round, we successfully reinterviewed 92 percent of households contacted in the first Indonesia Family Life Survey (IFLS1). The overall structure of the IFLS provided the framework within which the household decisionmaking module was implemented. The development proceeded in stages, including a review of ethnographic literature, focus groups with men and women in Jakarta and in nearby rural areas, and pilot tests and pretests of versions of the module.

Review of the Ethnographic Literature

Indonesia is extremely diverse ethnically. By reviewing the anthropological literature, we developed a better understanding of differences among ethnic groups. Because ethnic variation has potentially important implications for patterns of intrahousehold decisionmaking in Indonesia, the chapter briefly describes some of the main dimensions of diversity among ethnic groups.

Focus Groups of Men and Women

Until recently, relatively few household surveys have included questions about intrahousehold decisionmaking and the relative power of husbands and wives. Thus, an important first step in designing the decisionmaking module was to conduct focus groups in an urban and a rural area of Indonesia. In each site one focus-group discussion was conducted with men and one with women. The topics for discussion were (1) areas of disagreement between husbands and wives about how money should be spent, (2) whether it was appropriate for husbands and wives to retain separate pots of money, (3) whether certain aspects of day-to-day life were particularly the concern of women, men, or both jointly, and (4) the importance of arranged versus unarranged marriages and the role of dowry and bride price.

Pilots and Pretests of Modules

The focus groups provided the basis for designing a structured questionnaire module to be administered as part of a pilot test, the results of which were used to further refine the questions and construct the survey instrument.

Survey Instrument

The module comprised three components. The first battery of questions focused specifically on how couples deal with money. Respondents who had a regular source of income were queried about their autonomy in spending that money for household expenses and about whether they saved a portion over which they retained control. Respondents were asked the same set of questions about their spouse, if their spouse had a regular source of income. The second battery of questions concerned how families make decisions about expenditures and use of time. Each respondent was asked who in the household made decisions about expenditures or use of time for each of 17 items. The last battery of questions in the module attempted to provide insight into the relative status of husbands and wives within the household. These questions focused on the family backgrounds of husbands and wives at the time of marriage. Each respondent was asked to evaluate the relative position of his or her parents in relation to his or her spouse's parents at the time that the respondent married the spouse.

Because the questions were asked not just about the respondent, but also about the respondent's spouse, it was possible to consider the answers from multiple perspectives: how individuals perceived their own situation, how they perceived their spouse's situation, and whether the perceptions of each member of the couple corresponded to those of the spouse.

Results

Money

About 20 percent of females and 16.3 percent of males reported that they set aside a portion of their income, which they could spend without consulting their spouse (Table 4.1). Much higher proportions of both women and men reported that they felt free to spend their income on household expenses. Certain patterns characterized couples rather than individuals. Most couples lived in households where neither kept money to him- or herself. Females were a little more likely than males to keep part of their income. In only about 8 percent of couples did both keep some of their income. The pattern was quite similar with respect to whether respondents felt comfortable using their spouse's money. Seventy-one percent of couples said that they would not take money from their spouse's purse if he or she were not around, and there was not much difference between male and female responses. With respect to freedom to spend, however, there were almost as many couples in

Table 4.1 Perceptions of income sharing and income pooling

Indicator	% that answer yes to questions		
	Females	Males	Joint distribution
1. Apart from money you use for household expenses, is there any part of your income that you set aside that you can spend without consulting your spouse?			
All respondents	21.2 (0.8)	16.3 (0.5)	
Couples (both spouses asked)		21.7	19.2
of whom			
Both			7.8
Female only			13.9
Male only			11.4
Neither			66.9
2. Are you free to spend the money you earn on household expenses?			
All respondents	53.3 (1.0)	43.3 (0.7)	
Couples (both spouses asked)		53.1	43.0
of whom			
Both			27.5
Female only			25.6
Male only			15.5
Neither			31.4
3. If you needed money and your spouse was not at home, would you feel comfortable taking money from your spouse's wallet/purse?			
Couples	17.6 (0.5)	18.6 (0.5)	
of whom			
Both			6.8
Female only			10.8
Male only			11.8
Neither			70.6

Notes: The first two questions are asked only of respondents who earn income. The third question is asked of all respondents. Standard errors are in parentheses.

which only the female reported that she was free to spend without consulting her spouse as there were in which both couples were free to spend.

To determine what factors predicted men's and women's behavior with respect to managing money, probit regressions were performed on the behaviors discussed. The covariates included cultural norms/modernization (ethnicity and urban/rural location), measures of power (education, age, social status, and so forth), and dynamics of the interview (who was present).

The reference group for ethnicity was called “other/urban,” consisting of Chinese speakers and speakers of Indonesian or other languages who resided in Jakarta or West Java. Javanese, Sumatran, and (particularly) Minangkabau women were significantly less likely to report keeping money than the reference group. Balinese women and women from the outer islands were indistinguishable from the reference group. The results for men were not very different, although the coefficients were somewhat smaller in magnitude. Urban residence increased the chance that women and men retained part of their income.

Increasing levels of education for both the woman and her husband increased the chance that she kept part of her income, but only the man’s education affected the chance that he kept some of his income. As the age of her husband rose, a woman was less likely to keep part of her income, whereas her age was positively related to the chance that she retained some of her income.

The perceptions of the husband with respect to his family’s economic status were not associated with whether his wife kept part of her income, but when she perceived that his family was of higher status than hers, she was less likely to report retaining some of her income. Her perceptions that his family was of a higher status were also a significant predictor of whether he kept income.

Both Javanese and Balinese women were much less likely than women in the “other/urban” category to report that they felt free to spend their income on household goods, while Sumatran women and women on other outer islands were more likely to report feeling free. The relationship between ethnicity and freedom to spend money differed for men. Except for the Balinese, all other ethnic groups of men were more likely than their “other/urban” counterparts to feel free to spend their money.

On the question of whether women and men felt comfortable taking money from their spouse’s wallet or purse if they needed money and their spouse was absent, there were no differences between the reference category and Javanese and Sumatran men and women. Minangkabau women and men, however, were much less likely to feel comfortable using their spouse’s money. Balinese women and outer island men, however, were much more likely to feel comfortable using their spouse’s money.

It is clear from these results that perceptions varied significantly by ethnicity, as the ethnographic literature suggested it would, and by characteristics of husbands and wives that were related to their status in the household.

Decisionmaking

Respondents were asked to identify the primary decisionmaker for a series of different household activities. We distinguished decisions that were reported as being made by the male (alone), the female (alone), jointly (and possibly with others), and by someone other than the husband or wife (other).

The most striking result was the heterogeneity in decisionmaking among respondents. While managing household expenses on food and routine items was largely the wife's domain, the husband either took charge or played a role in the decision in about 20 percent of households. At the other extreme, the decision to use contraceptives was largely a joint decision. Between these extremes, there was a spectrum of distribution of decisionmakers.

The data show that many households appear to behave as if spheres of influence differ for men and women. But this finding tells us nothing about whether the unitary model of the household is appropriate, for it may be efficient for couples to invest in different spheres. If, however, measures of power do affect the choice of decisionmaker, then we would need to turn to more complex models of the household to understand behavior. Thus, we performed multinomial logit regression estimates to determine the probability that a decision was individualistic. For all decisions except use of contraceptives, the excluded group (modern or nontraditional groups) was the most likely to be individualistic in its decisionmaking. The Balinese, and to a lesser extent the matrilineal Minangkabau, were most likely to make decisions jointly.

Controlling for the husband's education, the wife's education can be interpreted as relative education (or a measure of relative power). According to the wives, an increase in a wife's education reduces the probability her husband will make decisions about food expenditures and increases the probability she makes the decisions. This pattern holds for all decisions except for one: as the wife's education increased, she was more likely to make decisions about child health jointly.

Men from higher-status families were more likely to make decisions about the health of their children, expenditures on the education of their children, durable expenditures, and the couples' use of contraceptives. This evidence suggests that these measures of power are indeed capturing something important in households and that they do affect decisionmaking.

Interview Conditions

The final set of covariates refers to the conditions of the interview and, in particular, whether the interview was conducted with the spouse present or alone. There is some evidence that these controls do affect the answers given

by respondents. At a superficial level, the controls should have no effect on behavior within the household and thus only reflect reporting error. That, however, presumes that the allocation of respondents to each interview type is random—which is not the case, since it is a choice of the respondent—and that there is no communication about the survey among the respondents after the interviewer has gone—which is also unlikely. Moreover, if the controls capture only interview conditions, the presence of the respondent at the spouse's interview should have no effect on one's own answer. That hypothesis is clearly rejected with these data. These results suggest that collecting information about couples in household surveys on an individual basis may prove to be quite difficult in practice.

Joint Significance of Indicators

In addition to the tests of significance of individual regressions, we tested for the joint significance of variables included in our various categories of predictors (Table 4.2). Taking covariates in groups, ethnicity is a powerful predictor of decisionmaking. It is significant in all the regressions. Social status indicators of the husband and wife are jointly significant in the domains of food, durables, and contraception; education of the respondents is significant in the child education, child health, and durables domains. In view of the importance of ethnic differences, we also explored interactions between ethnicity and the relative status of the husband and wife; no clear patterns emerge, with few of the interactions being significant.

Table 4.2 Joint tests of significance: *F* test statistics (*p*-values in parentheses)

	Food	Education	Health	Durable	Contraception
Social status of husband and wife	12.50 (0.01)	4.50 (0.34)	5.95 (0.20)	10.43 (0.03)	9.83 (0.04)
Education of husband and wife	1.77 (0.77)	31.54 (0.00)	14.63 (0.01)	13.94 (0.01)	8.16 (0.86)
Ethnicity of couple	128.40 (0.00)	54.84 (0.00)	66.15 (0.00)	56.91 (0.00)	55.92 (0.00)

Conclusion

This chapter has demonstrated that a combination of qualitative and quantitative approaches to studying the dynamics of power in the household can enrich our understanding of intrahousehold decisionmaking. Moreover, the paper demonstrates the feasibility of including in household surveys explicit questions on the management of household finances and on patterns of decisionmaking. Administering these questions to both husbands and wives provides a richer set of information than asking them of only one partner, although in practice it is difficult to completely isolate the spouses from one another during the interviews.

In this chapter, we have focused on a nonfinancial measure of power: the relative status of families of husbands and wives at the time of marriage. This measure does affect couples' financial arrangements and patterns of decisionmaking, which suggests the potential value of developing additional, noneconomic measures of power within the household.

The topic of power in the household, how to measure it and how to capture its effects on decisionmaking, resource allocation, and outcomes, is complex. If the models of household behavior that theorists put forth are to be tested empirically, it is imperative that surveys make increasingly sophisticated efforts to collect data that will be up to the task.

Dynamic Intrahousehold Bargaining, Matrimonial Property Law, and Suicide in Canada

Christopher Adam, John Hoddinott, and Ethan Ligon

Economists who analyze household decisionmaking allocation have traditionally assumed that the household acts as a single unit. They assume that there exists one decisionmaker whose preferences form the basis of household welfare and that all household resources are effectively pooled. This approach is known as the “unitary model,” the “common preference model,” or the “joint family utility model,” depending on the study consulted.

In recent years some researchers have questioned the assumptions behind this approach and explored an alternative framework, the “collective model.” This model takes as its starting point the possibility that different household members have different preference orderings and that the resolution of these differences is a nontrivial problem. A plethora of theoretical models has built on this starting point, but several scholars have noted that attempts to differentiate unitary from collective models suffer from several failings. One is the problem of “observational equivalence.” Certain collective models yield predictions identical to those derived from a unitary model. Another problem is that regressors that reflect bargaining power, such as an individual’s income, can plausibly be regarded as endogenous, thus introducing bias into the estimated parameters of the regressors. Finally, even if a “bargaining variable” is truly exogenous, it may be correlated with some unobserved characteristic of the individual, again producing biased parameter estimates.

An earlier version of this work circulated under the title “Divorce Laws and Women’s Wellbeing in Canada”; see Hoddinott and Adam (1998).

This chapter develops a dynamic model of household bargaining and uses it to motivate an empirical analysis of the impact of changes in Canadian laws regarding the allocation of family assets upon divorce. The core feature of the model is that this change improves women's fallback position outside of the household and thus improves their position within the household. The empirical challenge is to find such a change that is not subject to the critiques already noted.

A Turning Point in Canadian Divorce Law

The study argues that changes in provincial divorce law in Canada provide precisely such an example of an exogenous effect supporting the assumptions of the collective model. Before proceeding to the conclusions of the study, we offer an overview of Canadian divorce law to give a sense of the empirical issues at stake.

Under early common law, the husband and wife became one person by marriage, and common law added the rider that the husband became that person.¹ The husband acquired control over all property owned by his wife at the time of marriage or acquired by her during marriage, except for minor, personal items such as jewelry and clothing. In the late 19th century, the enactment of the Married Woman's Property Act in the United Kingdom, and its subsequent replication in all Canadian provinces except Quebec, gave women the right to hold property in their own name, including property acquired both before and during marriage. The acquisition and ownership of property was tied, however, to direct financial contribution. If a husband was the household breadwinner while his spouse remained at home, the wife had no legal claim to assets acquired in her husband's name.

A case before the Supreme Court of Canada in 1973, *Murdoch v. Murdoch*, was the catalyst for change in this aspect of family law. The case involved a contested divorce between a Mr. and Mrs. Murdoch. For the first four years of their marriage, the Murdochs worked on ranches as a hired couple, with their pay being given to Mr. Murdoch. These funds were used, in part, to purchase a ranch and homestead. Over the next 20 years, Mrs. Murdoch made a substantial contribution to the operation and management of the ranch. When the marriage broke down, she sought a judicial separation and claimed she was entitled to a one-half share, not only in the homestead, but also in the ranch. In the absence of a direct, financial contribution or an extraordinary financial contribution, however, the court

¹This discussion draws heavily on McLeod and Mamo (1993, amended 1995).

held that Mrs. Murdoch's actions were "just about what the ordinary rancher's wife does." As there was no explicit agreement linking Mrs. Murdoch's labor efforts to an entitlement to a share of the ranch, she was deemed to have no interest in the ranch. She thus lost her case and faced financial destitution.

Almost immediately, remedial legislative action was put into place. The Government of Ontario passed the Family Law Reform Act, 1975. It provided that "no spouse should be dis-entitled to an interest in property simply because his or her efforts were no more than might be expected from a reasonable spouse of the kind." Nonmonetary contributions to the household, such as childcare, gave the contributory spouse an interest in assets acquired during marriage. It is important to note that the law applied to all marriages in existence at that time. The act was subsequently amended by the Family Law Act, 1978, which went on to "provide that upon marriage breakdown each spouse was entitled to an equal interest in the 'family assets' regardless of who owned the assets." Other provinces followed suit, with the exception of Quebec, which had inherited and modified French civil law.

Testing the Nash Model

The study tests the dynamic bargaining model by examining the impact of the change in divorce law on the suicide rates of Canadian women 25 and older (a proxy for married women). Although suicide rates might at first appear a rather extreme indicator of well-being, we believe it is well suited for the purposes of this study. Not only is the decision to take one's own life the ultimate indicator of an absence of well-being, but this hypothesis was first suggested by Durkheim ([1897] 1993) in his seminal study on the sociology of suicide. Using statistics on suicide rates in Ontario from 1960 to 1995, the study groups the data according to four age cohorts—excluding children and people over 65—and uses a multivariate analysis that controls for causes of suicide other than divorce law.

The data and the results of the tests conform to the hypotheses. Figure 5.1 illustrates the evolution of the age-specific suicide rates for females in Ontario. The data show a marked decline in female suicide rates in Ontario for the age cohorts 25–44 and 45–64 from the mid-1970s onward. By contrast, there is no obvious change in the rates for the younger cohorts. Furthermore, the two older cohorts share the timing and sign of the structural break in the suicide rate. An examination of male suicide rates in Ontario (Figure 5.2) also confirms the effects of change in the divorce law on women. Male suicide rates shift several years after female rates shift, suggesting that factors other than divorce law reform caused a break in the

Figure 5.1 Female suicide rates in Ontario, 1960–94

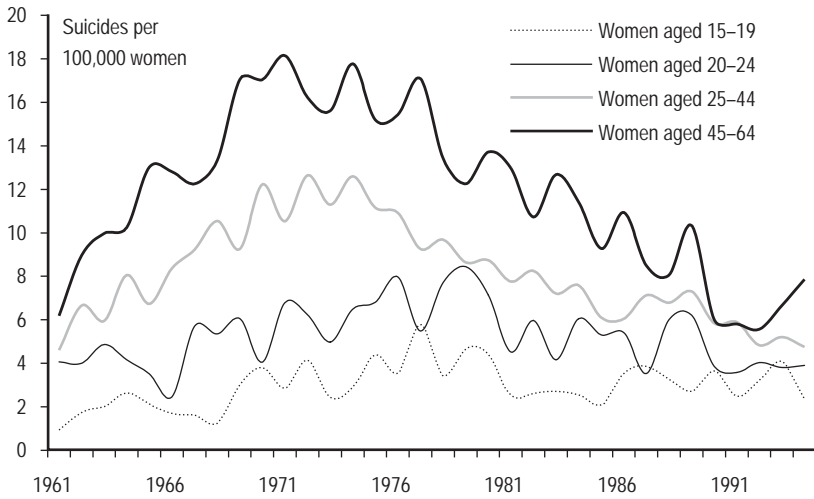
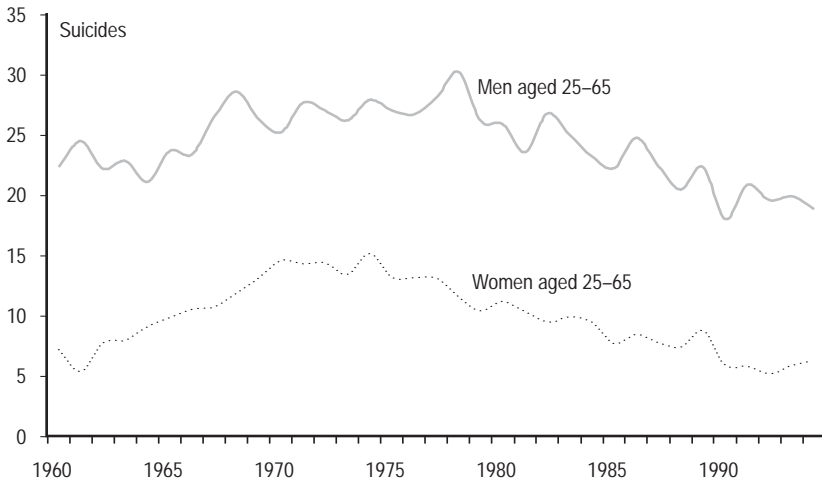


Figure 5.2 Male suicide rates in Ontario, 1960–94



trend of men’s rates. The tests are also extended to Quebec. Here, no legislative change took place and no structural break in the data is observed.

As such, the study contributes to the modeling of household behavior by encompassing cases in which outside options are relevant. Perhaps more important, it strengthens the claim that public policy can have powerful impacts within the household.

The Importance of Women's Status for Child Nutrition in Developing Countries

Lisa C. Smith, Usha Ramakrishnan, Aida Ndiaye,
Lawrence Haddad, and Reynaldo Martorell

One in every three preschool-aged children living in developing countries is malnourished. This disturbing yet preventable state of affairs causes untold suffering and, given its wide scale, is a major obstacle to the development process itself. Volumes have been written about the causes of child malnutrition and the actions that can be taken to reduce it—ranging from community-based feeding programs to accelerated economic growth (Smith and Haddad 2000). Until recently, too little attention has been paid to an obviously relevant yet little noticed issue: the role that the capabilities and well-being of children's caretakers, usually their mothers, play in children's nutritional well-being. This issue is the subject of this study.

The study's overall goal is to understand the links between women's status and child nutrition in developing countries. Women's status is defined as *women's power relative to men*.¹ Compared with their higher-status counterparts, women with low status tend to have weaker control over

For details see Smith et al. (2003).

¹Three aspects of the definition of women's status are worth noting. First, it is considered to be relative to men rather than absolute or relative to other women. Second, it is founded on the concept of power, defined as the ability to make choices (Riley 1997; Kabeer 1999). Third, the definition has an intrahousehold and an extrahousehold dimension—and thus takes into account the influence of customs and norms that may dictate differential roles, acceptable behaviors, rights, privileges, and life options for women and men (Safilios-Rothschild 1982; Agarwal 1997; Kabeer 1999).

resources in their households, tighter constraints on their time, more restricted access to information and health services, and poorer mental health, self-confidence, and self-esteem. Yet these factors are thought to be closely tied with women's own nutritional status and the quality of care they receive and, in turn, children's birth weights and the quality of care provided to children (Haddad, Hoddinott, and Alderman 1997; Engle, Menon, and Haddad 1999; Kishor 2000).

The study sets out to answer three main questions, focusing on South Asia, Sub-Saharan Africa, and Latin America and the Caribbean. First, is women's status an important determinant of child nutritional status in the three regions? Second, if yes, what are the pathways through which improved status operates? The particular pathways considered are women's own nutritional status, the quality of care for women, and the quality of care for children.² The specific caring practices analyzed are prenatal and birthing care for women, breast-feeding and complementary feeding of children, health-seeking behaviors for children, including illness treatment and immunization, and the quality of children's substitute caretakers. The third question the study sets out to answer is, why is South Asia's child malnutrition rate so much higher than Sub-Saharan Africa's? The wide gap in the regions' malnutrition prevalences has recently been termed the "Asian Enigma," because, mysteriously, South Asia is performing better than Sub-Saharan Africa in many of the long-accepted determinants of child nutritional status. These determinants include national income, democracy, food supplies, health services, and education. Ramalingaswami, Jonsson, and Rohde (1996) advance the hypothesis that it is the extremely low status of women in South Asia compared with Sub-Saharan Africa that is at the root of the regions' nutritional status gap.

To answer these questions, this report brings together data on 117,242 children under three years old from 36 developing countries. These data were collected under the auspices of the Demographic and Health Surveys. Table 6.1 lists the countries and the number of children and women in the study sample for each country. Two measures of women's status are employed. The first, measured at the household level, is women's decisionmaking power relative to their male partners, usually their husbands. This measure is based on four underlying indicators: whether a woman

²"Care" is defined as "the provision in households and communities of time, attention, and support to meet the physical, mental, and social needs of the growing child and other household members" (ICN 1992).

works for cash, her age at first marriage, the age difference between her and her husband, and the education difference between her and her husband. The second, measured at the community level, is societal gender equality. It is based on girl-boy differences in nutritional status and preventive health care, as well as gender differences in adult education. This additional measure is included to capture the effects of gender discrimination that women may face when they leave their homes. In order to measure the first, the study sample is restricted to women with husbands. The children included are only those in two-parent households. Both women's status measures are constructed by combining the underlying indicators into an index ranging from 0 (lowest status) to 100 (highest) using factor analysis. Country fixed-effects multivariate regression, with controls for child, woman, and household characteristics, is the main empirical technique. Separate analyses are carried out for each region. Two pathways through which women's status may affect child nutritional status—food security and maintenance of a sanitary health environment—are not considered in the study owing to lack of data. Table 6.2 lists the measures of child nutritional status, women's nutritional status, and caring practices for women and children employed in the study.

Figure 6.1 shows the percentage of underweight, stunted, and wasted children by region. By all measures malnutrition is worst in South Asia, followed by Sub-Saharan Africa and Latin America and the Caribbean. Figure 6.2 compares women's status across the three regions. Both measures indicate that South Asian women have the worst status relative to men, followed by Sub-Saharan Africa and Latin America and the Caribbean. Note that women's status is very low in both South Asia and Sub-Saharan Africa compared with women's status in Norway, the country where women are considered to be most equal to men.

The regression results leave no doubt that women's status has a significant, positive effect on children's nutritional status in all three regions.³ Further, they give strong supporting evidence confirming that one of the reasons why women's status improves child nutrition is that women with greater status have better nutritional status, are better cared for themselves, and provide higher-quality care to their children.

³The underweight prevalence indicates the general nutritional status of a population of children; stunting indicates a state of chronic malnutrition, whereas wasting indicates a state of acute malnutrition.

Table 6.1 Description of data sets employed and study sample sizes

Region/country	Year of collection	Number of children	Number of women
South Asia			
Bangladesh	1997	2,767	2,633
India	1998	24,360	22,149
Nepal	1996	3,692	3,349
Pakistan	1991	2,497	2,203
Total		33,316	30,334
Sub-Saharan Africa			
Benin	1996	2,199	2,043
Burkina Faso	1993	2,398	2,283
Cameroon	1998	1,391	1,253
Central African Republic	1995	1,921	1,716
Chad	1996	3,235	2,958
Comoros	1996	841	729
Côte d'Ivoire	1994	2,504	2,297
Ghana	1998	1,495	1,391
Kenya	1998	2,410	2,129
Madagascar	1997	2,328	2,095
Malawi	1992	1,827	1,638
Mali	1996	4,355	3,980
Mozambique	1997	2,500	2,345
Namibia	1992	948	858
Niger	1997	3,683	3,367
Nigeria	1990	3,294	2,965
Rwanda	1992	2,285	2,085
Senegal	1997	2,205	2,007
Tanzania	1996	2,692	2,459
Togo	1998	3,218	3,010
Uganda	1995	3,032	2,625
Zambia	1996	2,988	2,655
Zimbabwe	1994	1,753	1,627
Total		55,502	50,515
Latin America and the Caribbean			
Bolivia	1997	3,230	2,814
Brazil	1996	2,004	1,793
Colombia	1995	2,254	1,979
Dominican Republic	1996	1,856	1,595
Guatemala	1995	4,816	4,052
Haiti	1995	1,370	1,201
Nicaragua	1998	3,205	2,818
Paraguay	1990	1,925	1,551
Peru	1996	7,764	6,915
Total		28,424	24,718
Total from all three regions		117,242	105,567

Table 6.2 Dependent variables of the study

Variable
Child nutritional status
Child's height-for-age Z-score
Whether child is stunted
Child's weight-for-age Z-score
Whether child is wasted
Child's weight-for-age Z-score
Whether child is underweight
Proximal determinants of child nutritional status
Woman's nutritional status
Woman's body mass index
Whether woman is underweight
Whether woman is overweight
Prenatal and birthing care for woman
Whether woman received any prenatal care
Whether woman with any prenatal care had at least three visits
Number of months before birth at which woman had first prenatal visit (for women with any prenatal care)
Whether woman gave birth in a medical facility
Child feeding practices
Breastfeeding
Whether breastfeeding was initiated within one day of birth
Whether child 0–4 months is exclusively breastfed
Whether child 0–4 months did not receive anything from a bottle (last 24 hours)
Duration of breastfeeding (months)
Complementary feeding
Whether child 6–12 months has received complementary foods
Whether child >6 months received a high quality food in the last 24 hours
Number of times child >6 months received anything to eat in the last 24 hours
Health of and health-seeking behaviors for children
Whether child had diarrhea, fever, or cough in the last two weeks
Whether child with diarrhea was treated
Whether child has ever been vaccinated
Whether child received recommended vaccinations for his or her age
Caretaker of child
Whether child has adult caretaker while woman works

The strength of the influence of women's status, however, differs widely across the regions. Women's status has the most influence where it is lowest. The strongest effect is found in South Asia followed by Sub-Saharan Africa, and it is weakest in Latin America and the Caribbean. Figure 6.3 illustrates these differences. It shows the predicted rate of child malnutrition at each level of the women's status indexes for the three regions. The sharp predicted

Figure 6.1 Percentage of underweight, stunted, and wasted children, by region

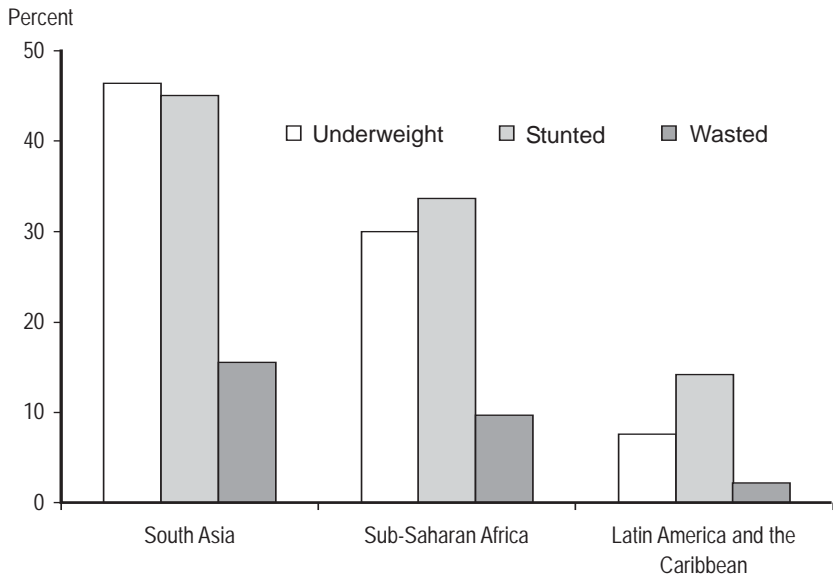


Figure 6.2 Women's status indexes, by region

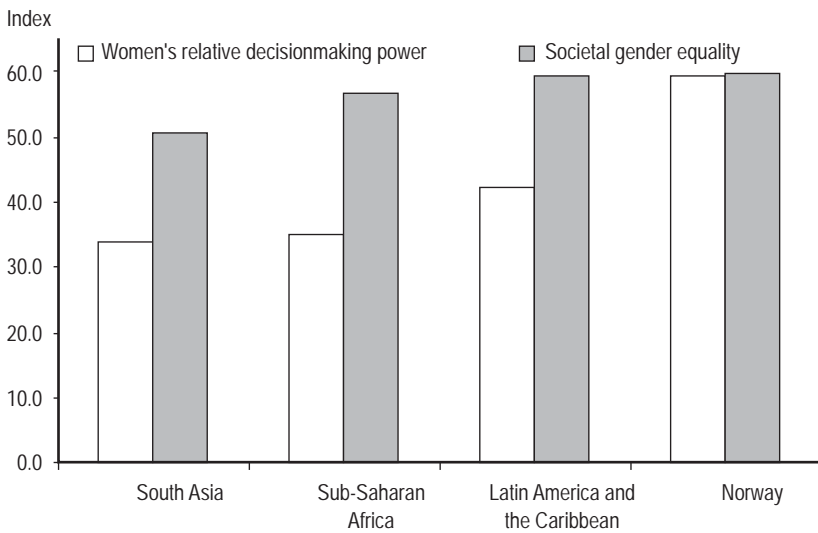
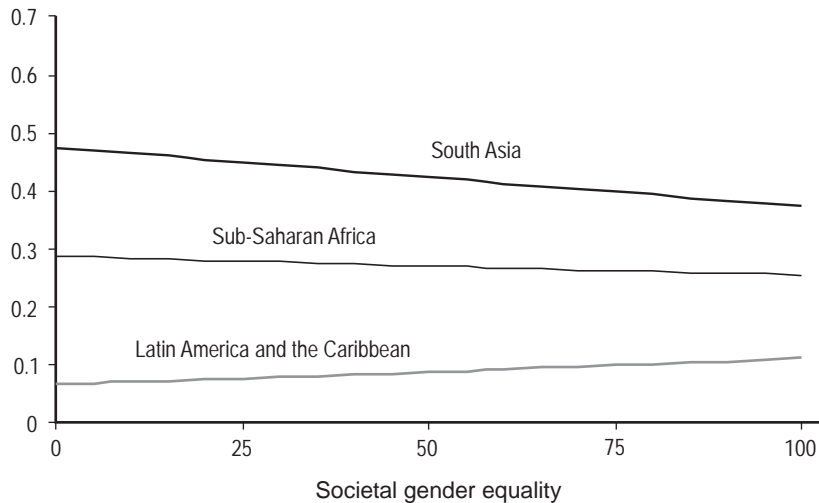
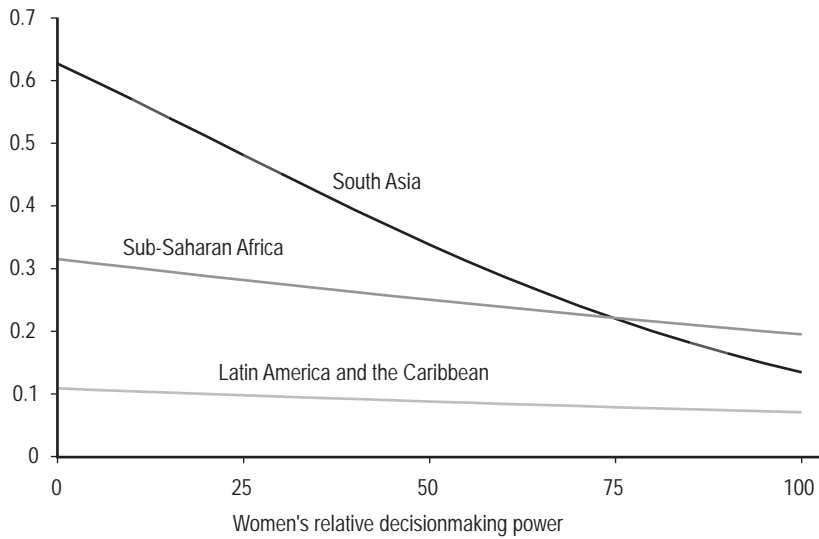


Figure 6.3 Predicted child malnutrition (underweight), by indexes of women's status



drop-off in child malnutrition in South Asia as women's relative decisionmaking power increases is particularly striking.

The pathways through which women's status influences child nutrition differ across the regions as well. In South Asia increases in women's status

have a strong influence on both long-term and short-term nutritional status, leading to reductions in both stunting and wasting. The malnutrition costs of inequality in the statuses of women and men in the region are high. The study estimates that if such status were equalized, the underweight rate among children under three years would drop by approximately 13 percentage points, which represents a reduction of 13.4 million malnourished children. As women's status improves in the region, improvements in women's nutritional status, as measured by body mass index (BMI), prenatal and birthing care for women, complementary feeding practices for children, treatment of illness and immunization of children, and the quality of substitute child caretakers take place as well. These, then, are among the pathways through which women's status influences child nutrition in the region.

As in South Asia, women's status in Sub-Saharan Africa has positive effects on both long-term and short-term nutritional status of children. The costs of inequality between women and men in the region are not as high as those in South Asia, but they are still substantial. Equalizing the status of the genders is estimated to lead to a decline of nearly 3 percentage points in the region's malnutrition prevalence, or a reduction of 1.7 million children under age three. The pathways through which improvements in women's status raise child nutritional status are largely the same as in South Asia. The main differences are that women's status increases women's BMI only among those women with very low decisionmaking power relative to their husbands, and it has no influence on illness treatment of children.

The Latin American and the Caribbean region exhibits quite a different pattern from South Asia and Sub-Saharan Africa. Women's status has a positive effect only on children's short-term nutritional status. The effect is strong only for households in which women's relative decisionmaking power is very low. Women's status has a distinctly *negative* influence on women's BMI in this region, where overweight is an emerging public health problem. The effect probably reflects the greater tendency to "weight watch" among higher-status women and is likely not harmful to children's nutritional status. The caring practices identified as pathways through which improvements in women's status affect child nutrition are prenatal and birthing care for women, one aspect of complementary feeding of children—that is, feeding frequency—immunization of children, and the quality of their substitute caretakers.

With regard to the Asian Enigma, the study identifies three broad socioeconomic factors contributing to the nutritional status gap between South Asia and Sub-Saharan Africa. The first, making by far the greatest

contribution among the three, is women's status. One reason why women's status contributes to the gap—congruent with the hypothesis of Ramalingaswami and peers—is because it is lower in South Asia than in Sub-Saharan Africa (see Figure 6.2). Women's status (especially women's relative decisionmaking power) is extremely low in both regions, however, and the difference between them is not large. More important is that the *costs* in terms of child malnutrition that result from women's lower status are far higher in South Asia than in Sub-Saharan Africa. This is because, as this study has shown, women's status exerts a stronger influence on child nutritional status in the former (see Figure 6.3). In short, the main reason that women's status places a wedge between South Asia's and Sub-Saharan Africa's child malnutrition prevalences is that women's low status in South Asia is more harmful to children's nutritional well-being than it is in Sub-Saharan Africa. Two additional socioeconomic factors that contribute to the regions' nutritional status gap are differences in sanitation and urbanization.

A deeper analysis reveals that South Asia is doing worse than Sub-Saharan Africa for a host of more proximal determinants of child nutrition. These determinants include women's nutritional status, prenatal and birthing care for women, the quality of complementary feeding practices for children, and child immunizations. The study also finds that other factors not measured in this study, such as some national characteristics of South Asian countries, have a strong negative impact on child nutrition and further widen the wedge between the regions' malnutrition rates. These characteristics may be related to climate, population densities, or culture.

The clear implication of the study's empirical results is that, in the interests of sustainably improving child nutritional status, women's status should be increased in all regions, but this need is especially urgent for South Asia, followed by Sub-Saharan Africa. Options for doing so include policy reform to eradicate gender discrimination and policies and programs that seek to reduce power inequalities between women and men by proactively promoting catch-up for women (World Bank 2001). Examples include targeting women for access to new resources, implementing cash transfer programs that promote girls' entry into education and health care systems, introducing labor-saving water and fuel technologies, providing subsidies for child care for working parents, and initiating programs to improve the nutritional status of adolescent girls and young women. It should be noted that improvements in women's status are likely to improve child nutrition in all of the South Asian countries. The effect of improving women's status in Sub-Saharan Africa and Latin America and the Caribbean, however, varies widely among countries. In some countries it is positive and in a few,

negative. Thus for these regions it is particularly important that more knowledge be acquired for each individual country before devising policy.

The study raises one important red flag: improvements in women's status are likely to have a *harmful* effect on one care practice for children, and that is breast-feeding. Breast-feeding is of critical importance to children's nutritional status because it both provides them with optimal nutrition and protects their health. It is thus vital that efforts to promote women's status be accompanied by simultaneous actions to protect, support, and promote breast-feeding. These efforts should include measures to improve the image of and attitudes toward the breast-feeding woman.

In areas where women's status is known to be low and efforts to increase it are met with resistance, strategies to promote children's nutritional status can include actions to mitigate the negative effects of power inequalities favoring men. For example, the study finds that gender inequality at the community level influences child nutrition primarily by reducing the use of health services for women and children. Thus it is not only household decisions that limit women's access to such services, but also the *availability* of health services in communities. Efforts to protect child nutrition can include targeting health services to areas where women's status is known to be low. This strategy provides an opportunity to break the link between women's status and child nutrition where improvements in women's status are particularly difficult to bring about.

One final important finding of the study is that in all three regions, women's relative decisionmaking power has a stronger positive influence on child nutritional status in poorer households than in rich. Efforts to improve child nutritional status through improving women's status are likely to be most effective when targeted at poor households.

In sum, this study shows that taking the policy decision to improve women's status offers significant benefits. Not only does a woman's own nutritional status improve, but so, too, does the nutritional status of her young children. Improving women's status today is a powerful force for improving the health, longevity, capacity, and productivity of the next generation of young adults.

PART 2

Agriculture and Natural Resources

Agriculture and Natural Resources: Overview

Agnes R. Quisumbing

Much has been written about the importance of gender issues in designing and implementing agricultural development projects (Cloud 1983; Alderman et al. 1994; Quisumbing et al. 1998). Part of this literature has been motivated by the important role that women play in food production, particularly in Sub-Saharan Africa (Boserup 1970; Dixon 1982; Gladwin and Macmillan 1989), as well as in the management of natural resources (Meinzen-Dick et al. 1997). A significant portion of this literature has also arisen because of the unintended consequences of agricultural development projects that were implemented without taking into account the different rights, resources, and responsibilities of men and women within the household (for example, Jones 1983; Dey 1985; Braun and Webb 1989).

This section on agriculture and natural resources revisits many of these key issues with new empirical evidence from Sub-Saharan Africa and South Asia. The first subsection focuses on the implications of a nonunitary model of the household on agricultural productivity in Sub-Saharan Africa. Unlike many parts of the developing world where the family farm is jointly managed and both husband and wife contribute labor to the family plot, many farms—and households—in Sub-Saharan Africa can be described as “separate plots” or “separate purses.” That is, it is not uncommon for men and women to farm their own plots separately, without pooling resources.

Despite the perception that women farmers are less efficient than men, a review of gender differences in agricultural productivity found no significant technical efficiency differences between men and women farmers, once individual characteristics and input levels are controlled for (Quisumbing 1996). Only one study, in Burkina Faso, estimated that women were less efficient than men farmers (Udry 1996). In this case, however, lower inputs into women's crops (which brought lower yields) resulted from highly asymmetric roles and household obligations. The review suggests that equalizing men's and women's education, physical capital, and cash inputs could lead to significant productivity gains. Simulations based on coefficients estimated from a study of maize farmers in the Vihiga District of Kenya in the 1970s (Moock 1976) suggest that giving women at least a year of primary education can raise women farmers' yields by 24 percent. Simulations using another study in Kenya (Saito, Mekonnen, and Spurling 1994) suggest a 22 percent increase in women's yields from maize, bean, and cowpea plots if women farmers are given the human capital and input levels of male farmers. These simulations did not, however, take into account how input levels could actually be increased. Moreover, none of the studies (with the exception of the Burkina Faso study) paid explicit attention to the possibility that a different, nonunitary model of household behavior may be driving farm decisionmaking.

The Alderman et al. study (Chapter 8) revisits the Burkina Faso study by estimating the productivity gains that could result if resources were reallocated within the household. Chapter 9 by Smith and Chavas looks deeper into the household to ask to what extent preference differences between husband and wife could explain low supply response in African agriculture, using simulation methods based on the same data set from Burkina Faso. Although the methods are different—the Alderman et al. study uses econometric techniques while Smith and Chavas use simulation methods—the chapters are complementary in shedding light on the implications of inefficient household resource allocation on agricultural productivity.

The next four chapters are based on a study of the impact of commercial vegetable and polyculture fish production in Bangladesh, two potential “food-based” strategies to alleviate micronutrient malnutrition, a serious problem in Bangladesh, particularly among women and children. Aside from its focus on food-based interventions, this study also illustrates differences in how these new agricultural technologies were disseminated—whether through nongovernmental organizations explicitly targeting women or through more traditional extension programs. Some of the

nongovernmental organization (NGO) programs targeted toward women aimed not only to increase food production, but also to promote women's empowerment by giving them opportunities to earn their own income. The four chapter briefs illustrate the range of policy issues that can be addressed with an intrahousehold perspective. Chapter 10 (Bouis) investigates the impacts of the new agricultural technologies on income, food consumption, and nutrition. Chapter 11 (Bouis, Bhargava, and Scrimshaw) takes a closer look at the effectiveness of food-based interventions in improving the iron status of women. Chapter 12 (Naved) uses qualitative methods to examine the intrahousehold impact of technology transfer, and Chapter 13 (de la Brière, Hallman, and Quisumbing) examines the differential impact of men's and women's resources on a range of intrahousehold allocation outcomes.

Finally, the last chapters of this section look at the impact of agricultural production programs and environmental goods scarcity on another scarce resource: time. Many studies have documented the long hours spent by women compared with men in productive activities, including water and fuel gathering (McGuire and Popkin 1990; Brown and Haddad 1995).¹ The extent of rural women's multiple responsibilities often imposes time and energy constraints on their participation in programs designed to increase their incomes and on their willingness to adopt new technologies. The artificial dichotomy between "productive" and "reproductive" activities, or work "outside" and "inside" the home, may unwittingly lead planners and aid agencies to improve both types of activities without taking into account their interdependence, their aggregate impact, and the opportunity costs involved (Hammam and Youssef 1986). Chapter 14 (Paolisso et al.) examines the impact of the introduction of new crops on time allocation in Nepal, while Chapter 15 (Cooke St. Clair), also on Nepal, investigates how increased scarcity of environmental goods—firewood and fodder—affects the time allocation of men and women.

Contributions of Each Chapter

Agricultural Productivity in Africa

The Alderman et al. chapter finds that yields on women's plots in Burkina Faso are lower than on men's plots, as a result of lower allocation of labor

¹The McGuire and Popkin paper (1990) reviews an extensive literature on time allocation, including Caldwell et al. (1980), Evenson, Popkin, and King-Quizon (1980), Popkin (1980), Mueller (1984), and Goldschmidt-Clermont (1987). The Brown and Haddad paper (1995) is based on new analysis of IFPRI data sets.

inputs (both family and unpaid exchange labor) and fertilizer to women's plots. The study finds that the output of women's plots, and therefore total household outputs, could be increased by 10–20 percent by reallocating resources from men's plots to women's plots. The chapter questions the assumptions about efficient resource allocation within households and suggests that development interventions be assessed in terms of the responses of individuals within the household. Policymakers need to use models that accurately reflect complex household dynamics in order to design effective policy interventions.

Also using a data set from Burkina Faso, Smith and Chavas (Chapter 9) examine the implications of differences in preferences between spouses on the household's response to increased cash crop prices. The chapter uses a two-stage game theoretic model that reflects the "semi-cooperative" nature of Burkinabé household decisionmaking. The model is used to conduct a simulation analysis of the supply response to increased cotton prices resulting from agricultural liberalization in Burkina Faso. The principal conclusion of the study is that the difference in preferences between women and men in nonresource-pooling West African households mutes supply response. The simulation analysis predicts that semi-cooperative monogamous Burkinabé households will have a cotton supply response 25 percent lower than households whose members have identical preferences. This result suggests that the effects of intrahousehold preference heterogeneity may be quite significant quantitatively. It can thus be added to the list—along with market failures, poor infrastructure, and risk aversion—of potential structural constraints to agricultural supply response in West Africa.

New Agricultural Technologies in Bangladesh

Chapter 10 on agricultural technology describes the overall context of the introduction of new agricultural technologies in three sites in Bangladesh, inequalities in food distribution within the household, which is biased against women, and the effects of adoption on own-consumption and nutritional outcomes. The new technologies have not significantly improved the micronutrient status of household members through better dietary quality, since own-consumption of adopting households did not increase significantly. Impacts on overall household income, although positive, are not strong. But efforts to increase the supply of meat, fish, and poultry products are needed to bring down the price for consumers. Consumers also need to be informed and convinced about the benefits of increased vegetable consumption for improving vitamin A status.

Chapter 11 discusses the cost-effectiveness of various approaches to reduce iron-deficiency anemia, a serious problem among women in rural Bangladesh. While the effect of iron supplementation in improving population hemoglobin is 3.5 times as strong as doubling the amount of iron in rice, the cost per person is more than 100 times as high. Plant breeding for improved iron content seems to be the most cost-effective way of reducing iron deficiency anemia among women. Aside from breeding to improve the micronutrient density of staple food crops, food-based approaches could also include ways to increase production of meat, fish, and poultry in order to reduce prices to consumers.

The Naved chapter looks at the impact of the new agricultural technologies through the eyes of the women themselves, based on focus groups among women in adopting and nonadopting villages. The study found that income gains from the adoption of the improved vegetable seeds were not substantial. Even if women were targeted for the project, their ability to benefit was limited because the land tenure system was not in their favor, and the strict enforcement of *purdah* meant that women could not cultivate the land themselves, negotiate in markets for inputs, or market the produce themselves. The adoption of fish production technology by women's groups appeared to promise better results by challenging the gender division of work space and giving women direct control of the fishpond production process.

Chapter 15, which summarizes two studies testing the unitary versus the collective model of the household, investigates whether resources held by men and women have differential effects on expenditure allocations (Quisumbing and de la Brière 2000) and child health (Hallman 2000; reported in greater detail in Chapter 17). These studies use various measures of men's and women's resources—assets at marriage, as well as current assets. Similar to the findings in Section 1, Bangladeshi husbands and wives deploy the bargaining power that comes with ownership of assets at and during marriage to different ends. Women's assets at marriage, for example, have a positive and significant effect on children's clothing and education expenditures; they also reduce the morbidity of girl children. Husbands' assets at marriage significantly (and negatively) affect expenditure on fuel. Higher dowry payments to men, however, reduce child morbidity, regardless of sex. Husbands' current assets have a positive effect on food expenditure and a negative effect on expenditure on men's and women's clothing, services, durables, and personal care. Women's current assets continue to be positively associated with expenditure on children's clothing and education. In terms

of health, the higher the mother's current assets, the greater the reported illness days for boys. The reverse is true in the case of the father.

Cash Crops, Environmental Goods Scarcity, and Time Allocation in Nepal

The Paolisso et al. study examines male and female time allocation to assess the impact of a project designed to commercialize vegetables and fruits. The project was successful in targeting both male and female farmers—both head males and females increased time spent on growing vegetables and fruits—but the impact on childcare time differed across households. For groups of parents with more than one preschooler, the increased time in agricultural production did not reduce total parental time spent on childcare. For groups of parents with only one preschooler, however, increased time in vegetable and fruit production did reduce childcare time. Communications programs for vulnerable households may thus be needed in the short run to protect time for childcare.

The Cooke St. Clair study uses a panel data set from Nepal to examine the impact of changes in environmental conditions on household labor allocation to collection of firewood and leaf fodder. In 1982/83 households responded to the increasing costs of environmental goods by consuming less of them and devoting more female time to their collection. In 1997 a resurvey of the same households showed that collection times have decreased both for men and for women. This decline was due not to successful forest rehabilitation by user groups, but to reduced consumption and increased collection from private land. Poorest households who do not have access to land may bear the highest costs of environmental degradation, at least in terms of the labor burden required for collection.

Key Messages

1. Inefficiencies in intrahousehold resource allocation may be a factor underlying yield gaps and low supply response in West Africa. A reallocation of resources from men's to women's plots, for example, has the potential to increase yields by 10–20 percent. Simulations also suggest that differences in preferences between spouses result in a supply response that is 25 percent lower. Policymakers need to take into account the different preferences and responses of individuals within the household when designing and implementing policy interventions.
2. Taking into account the cost of fortification and iron supplementation, food-based approaches seem to be the most cost-effective way of reducing

- iron deficiency anemia among women. In addition to plant breeding to improve the micronutrient density of staple food crops, food-based approaches could also include ways to increase production of meat, fish, and poultry in order to reduce prices to consumers.
3. The dissemination process of agricultural technologies matters. Even if new technologies are targeted toward women, their impact may be limited if they do not challenge traditional norms or the gender division of labor and work space. Successful interventions may need to provide alternative sources of social support in order to realize their gender-related objectives.
 4. Increasing women's control over resources—the objective of many of these NGO programs—tends to increase expenditures on education and child clothing and to improve girls' health.
 5. New technologies also need to be evaluated in terms of their effects on time allocation. Introduction of new crops in Nepal has resulted in increased time spent on agricultural production, but the effect on time spent on childcare has not been uniform across households. Communications programs for vulnerable households may thus be needed in the short run to protect time for childcare.
 6. Households may respond to increased scarcity of environmental goods by increasing the time spent collecting these goods. Households may also reduce consumption of these goods, however, and increase consumption of environmental goods collected from private land. The net impact of environmental scarcity on men's and women's time needs to be carefully evaluated, bearing in mind that the adverse impact of environmental scarcity may be worse for the poor.

Gender Differentials in Farm Productivity: Implications for Household Efficiency and Agricultural Policy

Harold Alderman, John Hoddinott,
Lawrence Haddad, and Christopher R. Udry

This chapter challenges one of the main tenets of agricultural economics—that households behave as though they are single individuals, with production factors allocated efficiently between men and women. In many contexts this is a convenient and innocuous assumption. It can be quite restrictive, however, when investigating the causes and welfare consequences of gender differences in agriculture. In response to a growing number of econometric studies that have found strong evidence against the hypothesis that households act as if they are individuals, researchers have proposed a number of different models of the interaction that occurs between individuals within the household. Many of these models share with the standard model the assumption that the allocation of resources is Pareto efficient. These models make a variety of alternative assumptions, however, concerning the sharing rule within the household and the threat points used as fallback positions by the individuals in the household in the event that a cooperative equilibrium is not achieved.

This conception of the household is far richer than the traditional unitary model. It opens the door, in particular, to an analysis of the distribution of resources within the household. Even this enriched vision of the household is too narrow, however, to address most of the concerns raised by observation of gender differences in agricultural production. The problem is that the assumption that intrahousehold allocations of *consumption* are Pareto

For details, see Alderman et al. (1996).

efficient minimally implies that the allocation of resources in *production* is allocatively efficient. This implication, in turn, implies that although the issues of gender and intrahousehold allocation may have distributional implications, they are unrelated to productive efficiency. For example, discrimination against women in the allocation of credit might weaken the bargaining position of women (and thus lower their welfare), but any credit that reaches any member of a household will be allocated efficiently across the productive activities of *all* of the members of the household.

The chapter tests the assumption of Pareto efficiency in production using an extremely detailed farm-level agronomic data set from six villages in Burkina Faso. An important characteristic of the farming systems in these villages, as in much of Sub-Saharan Africa, is that different members of the household simultaneously cultivate the same crop on different plots. This makes Burkina Faso an unusually opportune environment in which to test whether differences in who controls the plots (the man or woman of the household) are reflected in how resources are allocated across those plots. Pareto efficiency in production implies that yields should be the same on all plots planted to the same crop within a household in a given year (controlling, of course, for plot characteristics).

The data are from a four-year (1981–85) panel study, conducted by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), of 150 poor households (with incomes of less than US\$100 per capita) in six villages in three agroclimatic zones.¹ Enumerators visited the sample households every 10 days to collect information on inputs (labor, manure) and outputs on each plot since the previous visit, yielding usable data on a total of 4,655 cultivated plots. The data also included plot area, location, topo-sequence, and local name for soil (one of 89 possible soil types), making possible a much finer control for land quality, another production variable, than is generally possible with developing-country data.

Findings

The analysis produced several surprising findings that contradict the assumption that household production factors are allocated efficiently between men and women. First, plots controlled by women have

¹For documentation of the survey, see Matlon (1994).

Table 8.1 Ordinary least squares (OLS) estimates of the determinants of crop yield per hectare

Independent variables	Dependent variable: Yield per hectare of		
	All crops	Sorghum	Vegetables (fonio/ earthpeas/ groundnuts/okra)
Gender (1 = female)	-.18 (-3.36) ^a	-.41 (-5.50)	-.21 (-2.06)
ln (plot area)	-.17 (-6.27)	-.30 (-8.81)	-.28 (-2.37)
Number of indicator variables for soil type, toposequence, and plot location	23	21	15
Joint <i>F</i> -statistic	1.69	19.49	11.91
Degrees of freedom	(23,1981)	(21,793)	(15,235)
(Significance = <i>p</i>)	(0.02)	(0.00)	(0.00)
Fixed-effect categories	Household- year-crop	Household- year	Household- year-crop

Note: *t*-statistics are in parentheses.

^a*t*-ratios based on heteroscedastic-consistent estimates of the variance-covariance matrix.

significantly lower yields than other plots within the household planted to the same crop in the same year but controlled by men. On average, yields are about 18 percent lower on women's plots than on similar men's plots simultaneously planted to the same crop within the same household (Table 8.1). The yield difference is as much as 40 percent for sorghum and 20 percent for vegetable crops, in which women tend to specialize. Large gender differences in yields, however, do *not* imply that women are less efficient cultivators than men. The yield differences might reflect differences in the intensity with which inputs are applied on men's and women's plots.

Indeed, plots controlled by men have higher labor inputs by both men and children than do plots controlled by women (Table 8.2). Plots controlled by women have labor inputs primarily from the women themselves. Nonhousehold labor (unpaid exchange labor) is used more intensively on plots controlled by men. Moreover, virtually all manure (fertilizer) is concentrated on the plots controlled by men. Previous studies (for example, those reviewed in Quisumbing 1996) have found differences in output per acre or per person but failed to isolate the source of these differences. This study finds that the gender yield differential is apparently caused by the difference in the intensity with which measured inputs of labor,

Table 8.2 Determinants of intensity of inputs at the plot level (fixed-effect Tobit estimates)

Variable	Hours of labor (per hectare)				Manure (kilograms per hectare)
	Male	Female	Child	Non- household	
Gender (1 = female)	-679 (-11.95)	42.72 (0.88)	-199 (-2.29)	-451 (?1.92)	-13.73 (-2.89)
In (plot area)	-219 (-9.80)	-316 (-8.47)	-112 (-2.46)	-181 (-1.39)	-6.14 (-2.45)
Number of indicator variables for soil type, toposequence, and plot location	20	20	19	19	19
Joint <i>F</i> -statistic	27.67	42.62	74.62	10.01	42.31
Degrees of freedom (Significance = <i>p</i>)	(20,1984) (0.00)	(20,1984) (0.00)	(19,1985) (0.00)	(19,1985) (0.00)	(19,1985) (0.00)
Fixed-effect categories	Household- year-crop	Household- year-crop	Household- year-crop	Household year-crop	Household year-crop
Mean of dependent variable					
All cases	427	466	86	85	1.70
When dependent variable > 0	507	517	203	213	7.78

Source: ICRISAT village-level data for Burkina Faso.

Note: *t*-statistics are in parentheses.

manure, and fertilizer are applied on plots controlled by men and women rather than by differences in the efficiency with which these inputs are used.

What are the implications of the existing allocation of resources across plots within the household? The analysis found that the output of women's plots, and therefore total household output, could be increased by between 10 and 20 percent by reallocating actually used factors of production between plots controlled by men and women in the same household (Table 8.3).²

Policy Implications

These findings suggest that a richer model of household behavior—one that takes into account internal household dynamics and recognizes that individuals compete as well as cooperate—is necessary for understanding the

²Table 8.3 uses alternative specifications of the production function: a Translog specification, which is more flexible, and a Cobb-Douglas specification.

Table 8.3 Average gains from equalizing inputs per hectare within household-year-crop groups

	Translog, all crops		Cobb-Douglas, all crops		Cobb-Douglas, sorghum		Cobb-Douglas, vegetables (fonio/groundnut/ earthpeas/okra)	
	Mean	Standard deviance	Mean	Standard deviance	Mean	Standard deviance	Mean	Standard deviance
Change in yield: average over plots	10%	(0.32)	11%	(0.28)	18%	(0.29)	4%	(0.26)
Change in output: average over groups	12%	(0.14) ^a	16%	(0.15) ^a	20%	(0.12) ^a	9%	(0.17) ^a

^a Does not account for sampling error in parameter estimates.

structure of agricultural production and for designing appropriate policy interventions.

These dynamics have affected a number of efforts to improve agriculture in Africa. For example, an attempt in the early 1980s to increase rice production among women farmers in Cameroon (Jones 1986) failed because rice was considered a male crop and any income generated from it would have been controlled by men, even if the crop were produced by women. Consequently, few women entered into rice cultivation. Instead, they continued to grow sorghum, the product they controlled, despite its lower returns. By contrast, a project in Togo to encourage soybean production (Dankelman and Davidson 1988) succeeded precisely because it was designed to ensure that the crop would remain in the hands of women. The soybeans were not introduced as a cash crop, which would have changed their status and made them a male crop; instead, they were promoted as legumes that could be used to make sauces. As a result, women began cultivating soybeans on their own small plots.

The effectiveness of interventions depends not just on how women respond to them, but on how others respond to them as well. For example, a fertilizer subsidy that increases the output from women's plots may, in the longer term, cause husbands to reduce the amount of land allocated at marriage. Thus it is not sufficient for the design of better policy to recognize that households do not act as single individuals. It is also important to recognize that changing the incentives or constraints faced by one household member may induce others to change their behavior in ways that frustrate the intention of the policy intervention. Only by using models that accurately reflect complex household dynamics will policymakers be able to design policy interventions that are effective.

Supply Response of West African Agricultural Households: Implications of Intrahousehold Preference Heterogeneity

Lisa C. Smith and Jean-Paul Chavas

Traditional models of household economic behavior have portrayed households as unified entities. They assume that household members agree about decisions and share resources in the most equitable way possible.

More recently, however, economists have come to view households as domains of difference, where multiple decisionmakers may have different preferences and, in many cases, control separate sets of resources. This new approach has greatly improved understanding of household resource allocation behavior. It has demonstrated that heterogeneity among members affects a variety of individual, household, and economywide outcomes (Haddad, Hoddinott, and Alderman 1997). Recent research on West African households, in particular, has shown that gender differences in resource allocation behavior result in inefficiencies that reduce overall household production and income (Udry 1996).

This chapter seeks to deepen understanding of the implications of gender-based intrahousehold heterogeneity by asking what role it plays in the effects of agricultural price policies. In particular, the chapter analyzes how differences in women's and men's preferences in rural Burkina Faso affect the production response of farm households to increased cash crop prices. Price policies that give households incentives to increase cash crop production are considered important instruments for accelerating agricultural and economywide growth, reducing poverty, and improving rural people's well-

For details, see Smith and Chavas (1999).

being. Policymakers and researchers, therefore, have great interest in better understanding how households will react to price incentives.

Explaining Household Supply Response to Price Changes

Conventional wisdom holds that semi-subsistence developing-country households have a positive but weak production response to price changes. Sitting on the market-nonmarket divide, these households have shown low levels of responsiveness to price incentives and opportunities to adopt productivity-enhancing technologies for cash crop production.

Considerable debate surrounds the underlying causes of this sluggish supply response. One school of economic anthropology attributes it to the “peasant”-specific desire to satisfy only survival needs or ensure “simple reproduction” rather than maximize income. A countering, structuralist explanation says that labor and food market failures make households dependent on their own labor and home-produced food, constraining their ability to respond to price incentives (de Janvry, Fafchamps, and Sadoulet 1991). The structuralist explanation also sees poor infrastructure and technological development, unavailability of irrigation and productive inputs, missing credit markets, seasonal labor shortages, and lack of industrial consumer products that might motivate efforts to earn cash income as constraints that stifle supply response. Furthermore, risk-averse agricultural households may be unwilling to rely exclusively on purchases of food in volatile markets to meet their food needs. The exposure to food price risk may also weaken supply response (World Bank 1991; Barrett 1994; Chavas 1995).

Insights gained from studies of household behavior that take an intrahousehold approach further deepen the supply response debate. These studies reveal that where individual household members control resources, increases in cash crop prices can alter the opportunity sets of female and male household members in different ways. Price changes bring with them conflict-laden negotiation over who gains the (income) benefits and who bears the (labor) costs of increased cash crop production (Whitehead 1990a, b). The conflict manifests itself in bargaining over transfers of income to women from men and over women’s labor contributions to the production of the crop whose price has changed (Jones 1983). That conflict may play a role in stifling a household’s supply response. The studies suggest that (1) decisionmaking in households is not necessarily a joint effort and members

value individual control over resources; and (2) preference heterogeneity between spouses can have real consequences for the changes in household production, income, and welfare that accompany changes in the economic environment.

This study brings these new insights from the intrahousehold literature to bear on the supply response debate. It proposes a game theoretic model that reflects the “semi-cooperative” nature of Burkinabé household decisionmaking as described. The model is the basis for a simulation analysis of the supply response to increased cotton prices resulting from agricultural liberalization in Burkina Faso. The analysis focuses only on monogamous households, assuming a two-decisionmaker household made up of a woman and her husband. The simulations are undertaken using the nonlinear mathematical programming solver MINOS in GAMS. The data employed to parameterize the model come from a survey conducted in Burkina Faso by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and from secondary sources.

Different Resource Allocations Depending on Preference Heterogeneity

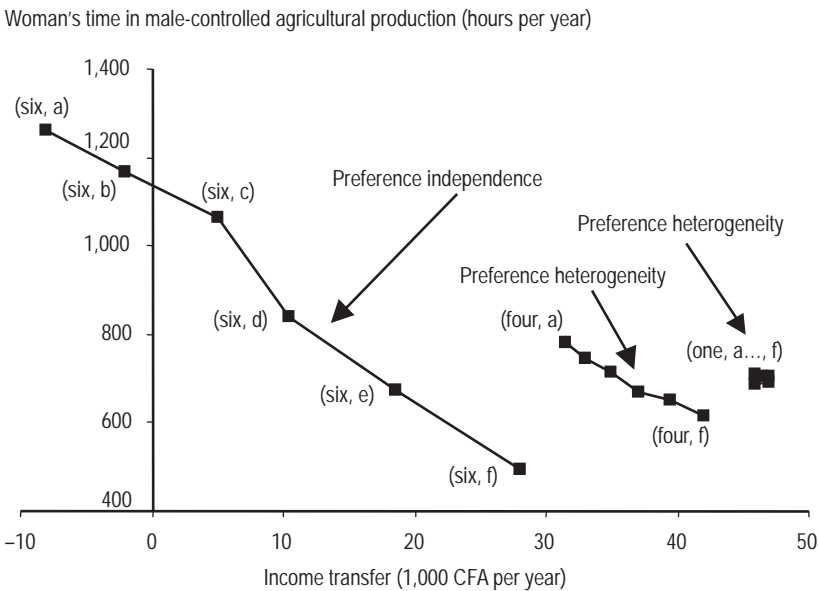
The simulation model explicitly allows for the process of bargaining over income transfers from husbands to wives and over wives’ labor contributions to male-controlled agricultural production. Bargaining is governed by both (1) the degree of difference in the spouses’ preferences and (2) their relative bargaining powers. Because of measurement difficulties, it is not easy to pinpoint an exact level of these parameters for any given population. When simulation techniques are used, however, it is possible to consider a wide range of alternative scenarios that differ along the two dimensions.

A continuum of six preference divergence cases are considered, denoted “one” (for preference homogeneity, that is, the spouses have the same preferences), “two” through “five” (for cases of increasing preference heterogeneity), and “six” (for preference independence, where the spouse’s preferences are very different). Within each of the preference divergence cases are embedded six relative bargaining power cases, denoted “a” through “f.” In case “a” the man has much greater bargaining power than his wife. In cases “b” through “e,” bargaining power becomes more equal. In case “f,” the spouses’ bargaining powers are approximately equal. In sum, the 36 scenarios range from “(one, a),” in which the husband’s and wife’s preferences are the

same and bargaining power greatly favors the man, to “(six, f),” in which preferences diverge greatly and bargaining power is equal.

Figure 9.1 illustrates the fundamental role of preference heterogeneity in influencing household resource allocation. It traces out the model’s output for optimal levels of income transfers (on the horizontal axis) and women’s time spent in male-controlled agricultural production (on the vertical axis) under different assumptions regarding the degree of preference heterogeneity within the household. Under preference independence (left-most curve)—in which a husband and wife do not share the same preferences—the outcomes vary greatly depending on each spouse’s bargaining power. The lower the wife’s bargaining power is relative to her husband’s, the higher is the amount of time she spends in male-controlled production and the lower is the income transfer to her. Under preference homogeneity, by contrast, bargaining power does not matter: because spouses agree on how resources are to be allocated, power imbalances between them make no difference.

Figure 9.1 Relationship between woman's time spent in male-controlled agricultural production and income transfers from man to woman under alternative scenarios



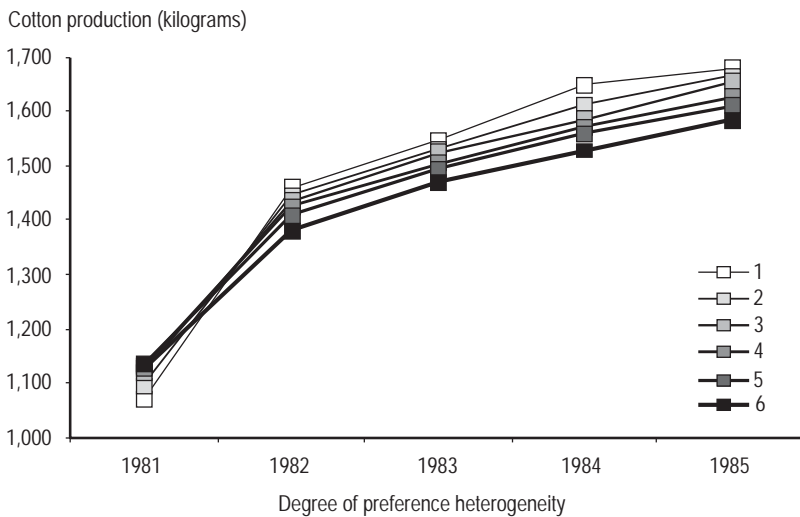
Note: Cases “a” through “f” represent relative bargaining power of the woman and man. In case “a,” the man has much greater bargaining power than the woman. In case “f,” bargaining power is equal.

Simulation of Agricultural Price Liberalization in Burkina Faso

The simulation analyzes the production impact of a 60 percent increase in the price of cotton and a 120 percent increase in the price of fertilizer that took place over 1982–85 as part of a structural adjustment program. Because the analysis allows for a number of alternative preference divergence scenarios, it is possible to determine the independent influence of preference heterogeneity on the production response to price changes. One of the relative bargaining power cases, case “d,” in which the wife has a fairly high degree of bargaining power yet still lower than her husband’s, is chosen for this exercise based on a validation analysis using the ICRISAT data. The validation exercise also tests for the appropriate degree of preference heterogeneity applicable to Burkina Faso and finds it to be case “six,” or preference independence.

Figure 9.2 reports the predicted increases in cotton production over the four years. Production increases in all cases. The percentage increase

Figure 9.2 Simulated impact of price increases on cotton production over 1981–85 under alternative scenarios



Note: Relative bargaining power case “d” is assumed.

declines, however, as preference heterogeneity increases—from 56.7 percent under preference homogeneity to 40.3 percent under preference independence. The increase in cotton production over the four years under preference homogeneity is 607.5 kilograms; it is 456 kilograms in the case of preference independence. Thus, the simulation model predicts the cotton supply response of monogamous Burkinabé households to be 25 percent below that for households employing the same technology and facing the same resource limitations but whose members have identical preferences.

Conclusion

The principal conclusion of the study is that the difference in preferences between women and men in nonresource-pooling West African households mutes supply response. The simulation analysis suggests that the influence of intrahousehold preference heterogeneity, in the presence of bargaining power imbalances, may be quite significant quantitatively. It can thus be added to the list—along with market failures, poor infrastructure, and risk aversion—of potential structural constraints to agricultural supply response in West Africa.

This study shows how an intrahousehold approach can contribute to a better understanding of the effects of price policies, which depend on the manner in which individuals in households—rather than households as a whole—respond to price changes. The response, in turn, depends on how the price changes are likely to affect the control of resources within households. Furthermore, resource control is influenced by the individual's ability to bargain with other household members over the benefits (and costs) flowing from the price changes. By taking these realities into account, policies designed to improve supply response can be both more effective at reaching their goal and more beneficial to households and all the individuals in them.

Commercial Vegetable and Polyculture Fish Production in Bangladesh: Impacts on Income, Food Consumption, and Nutrition

Howarth Bouis

In rural areas of Bangladesh, poverty is pervasive and associated with high rates of malnutrition, especially among preschool children and women. Apart from low levels of energy intakes, it is increasingly recognized that rice-dominated diets such as those consumed by most poor in the countryside may not supply all micronutrients required for a healthy life and productive activities. Children and women are particularly vulnerable to these micronutrient deficiencies because they face relatively higher requirements for growth and reproduction. In Bangladesh, as in other countries in South Asia (see Smith et al., Chapter 6), a pro-male bias in food distribution owing to women's low status and bargaining power within the household may underlie women's inability to meet their micronutrient requirements.

Poor dietary quality is a primary cause of micronutrient deficiencies. Low intake of vegetables, fruits, pulses, fish, and animal products are compounded by frequent attacks of diarrhea and other infectious diseases in a spiral of increasing deficiencies. Nonstaple foods, particularly animal products, are rich sources of bioavailable minerals and vitamins but too expensive for the poor to buy in sufficient quantities.

There is considerable interest in food-based strategies to alleviate micronutrient malnutrition, interventions that can complement supplementation and fortification programs and seek to improve dietary quality directly. Promotion of polyculture fish and vegetable production, two foods relatively rich in micronutrients, holds potential for improving

For details, see Bouis et al. (1998).

micronutrient status in Bangladesh (1) by increasing the supply of micronutrients to the general population and so lowering prices or maintaining constant prices in the face of rising demand due to population and income growth, and (2) by directly improving household incomes and intakes of fish and vegetables of producing households.

This study (Bouis et al. 1998) examines three nongovernmental organization (NGO) programs that promoted the production of polyculture fish and commercial vegetables by providing NGO credit and training programs directed at women: (1) commercial vegetable production on homestead plots in Saturia; (2) polyculture fish production in household-owned ponds in Mymensingh; and (3) polyculture fish production in group-managed ponds in Jessore. In Bangladesh, programs that combine new technologies with credit targeted to women can potentially increase women's bargaining power within the household (Naved, Chapter 12). In Saturia and Jessore, the new technologies were disseminated through groups that specifically targeted women. In Mymensingh, project and Department of Fisheries extension agents provided training in fishpond cultivation to relatively well-off households and the same training, combined with credit, to relatively poorer households. This program was intended for both men and women, though in practice there were more male beneficiaries. There was a quota, however, for credit targeted to women beneficiaries.

The Effects of Adoption on Household Income

Although apparently highly profitable compared with rice, the two technologies studied contribute rather modestly to overall household incomes. Because of the high profitability of the polyculture fish and commercial vegetable production on a per-acre basis, the potential exists for much higher impacts on household income, if land devoted to production and other inputs were to be increased. Researchers should give priority to identifying the constraints to more intensive adoption by adopting households.

Income, Food Prices, and Food Expenditures

Rice consumption does not vary significantly by income group, suggesting that consumers at all income levels give high priority to satiating hunger through rice consumption first. In contrast, animal and fish consumption rises rapidly with income on a proportional basis, roughly doubling between

low- and high-income terciles for the surveyed households. Consumption of nonstaple plant foods rises by a slower rate compared with income. There is roughly a 50 percent increase in intakes of nonstaple plant foods between low- and high-income terciles. Although animal and fish consumption accounts for, on average, only 3 percent of total energy intake, because of their high cost, animal and fish consumption accounts for 20–25 percent of food budgets, on average.

Intrahousehold Food Distribution

Preschoolers appear to be favored in intrahousehold distribution of food. Preschool boys in particular receive a disproportionate share of animal and fish products, which are the most expensive sources of energy and account for a high percentage of foods purchased at the margin as income increases. Because of the pro-male bias in food distribution and women's low status within the household, adult women tend to receive disproportionately lower shares of preferred foods. Although the energy intakes of adult women are, of course, substantially greater than those of preschool children, consumption of animal and fish products, an important source of iron, is about equal between adult women and preschool boys. This situation occurs despite women's higher biological need for micronutrients such as iron.

The Effects of Adoption of Own-Consumption

The adoption of the polyculture technology does lead to greater consumption of large fish but not of total fish. There is apparently a one-for-one substitution of large fish for small fish in nonadopting, fishpond-owning households. Small fish are more nutritious gram-for-gram than large fish, however, so the impact on dietary quality is negative, although the magnitude of the substitution is small. If scientifically feasible, there would seem to be a large opportunity for profitable production of small fish in privately owned fishponds if these small fish could be harvested during February through August when small fish prices are seasonally high.

Similar to the results for polyculture fish production, producers of vegetables developed by the Asian Vegetable Research and Development Center (AVRDC) and targeted to female NGO members do not consume disproportionately high amounts either of AVRDC-target vegetables or vegetables in total. A plausible explanation is that demand for vegetables

does not increase with income—that is, there is no latent, unsatisfied demand to be met. Production and marketing efforts need to concentrate (1) primarily on extending growing seasons in order to dampen seasonal price fluctuations and (2) perhaps secondarily on improving marketing channels so that vegetables may move cheaply and freely about the country in order to take advantage of differential regional growing seasons.

The Effects of Technology Adoption on Nutritional Outcomes

There is little reason to believe that adoption of the two technologies under study has improved the micronutrient status of members of adopting households through better dietary quality. There was no finding of disproportionately high own-consumption of fish and vegetables by adopting households. Impacts on overall household income, although positive, are not strong.

It is consumers in general, in both nonadopting and adopting households, who benefit nutritionally from research, extension, and credit programs, such as those studied in this chapter, to increase the market supply of vegetables and fish. All other things being equal, increased market supply will lower prices for these foods. Demand estimates demonstrate that consumers are price-responsive. Consumption of these foods will increase if prices decline. Conversely, if policies are not undertaken to increase supply, prices of nonstaple foods will almost certainly continue to increase in the face of population growth, and nutritional status will be further compromised.

Improvements in Household Income and Implications for Agriculture

Rural incomes are quite diversified. No single new technology will raise the incomes of a high proportion of low-income households by several multiples in just a few years. A range of new technologies must be continually improved and refined through research. Farming households must be taught to use the new technologies and to learn to adapt them to their specific conditions.

Commercial vegetable and polyculture fish production are promising, viable components of an overall agricultural development strategy, which perhaps might now best rely on nonstaple food products as key sources of

productivity growth. Although not analyzed in depth, the livestock sector emerged as an important source of income to rural households as well as a key source of micronutrient-status-improving food products. For various types of livestock, it is useful to compare profitability, labor use, and constraints to increased production with rice, vegetable, and polyculture fish production. Livestock raising is especially important for women, who use livestock as an avenue for asset accumulation.

Because poor nutrition results in high losses to productivity and individual welfare, and can be improved only gradually through income increases generated by agricultural development, specific interventions to improve micronutrient status in the short to medium term can provide a high return to investment. With respect to improving iron status, this report finds no evidence that diet-based interventions could be successful. The cost of animal and fish products is simply too high with respect to consumer purchasing power.

Diet-based interventions, however, may well be possible for improving vitamin A status because vegetable sources of beta-carotene are well within the purchasing power of poor consumers. The problem would appear to be one of consumer motivation—informing and convincing consumers of the benefits of pro-vitamin A consumption and providing the knowledge of which vegetables are rich sources. Education is key because there does not appear to be a strong, latent demand for vegetables, as there is for animal and fish products, as income increases.

Effects of Diet in Improving the Iron Status of Women: What Role for Food-Based Interventions?

Howarth Bouis, Alok Bhargava, and Nevin Scrimshaw

Iron deficiency anemia (IDA) affects more than 3.5 people in the developing world. More than half of pregnant women (56 percent) and 44 percent of nonpregnant women are anemic (ACC/SCN 2000). IDA contributes to approximately 20 percent of maternal deaths in Africa and Asia (Ross and Thomas 1996). In Africa alone, some 20,000 maternal deaths per year could be prevented with anemia treatment.

Poor diet quality and low bioavailability of dietary iron are important factors contributing to iron deficiency anemia (IDA), so one proposed solution to IDA consists of food-based interventions designed to improve people's diets. Yet little has been known about the magnitude of the effects of various components of the diet in reducing IDA under actual living conditions in rural areas. Can food-based interventions be successful in reducing IDA? Will such interventions be cost-effective compared with alternative interventions such as supplementation?

This study models the proximate determinants of hemoglobin concentration, a widely used indicator for assessing iron deficiencies that is measured in the field through a finger prick, for a sample group of rural women in Bangladesh. The results of the study provide valuable information for deciding the allocation of resources between interventions such as (1) iron fortification of rice through plant breeding, (2) government policies encouraging meat, fish, and poultry production, and (3) provision of iron supplements.

For details, see Bhargava, Bouis, and Scrimshaw (2001).

Methodology

Data on food intakes and hemoglobin concentration were available for 514 women in three survey rounds from three rural sites in Jessore, Manikganj, and Mymensingh (Bhargava, Bouis, and Scrimshaw 2001). In each of the three survey rounds, food intakes were measured using the 24-hour recall method for the four meals consumed—that is, breakfast, lunch, dinner, and snacks. The women's intakes of nutrients at each meal were estimated using food composition tables for six countries.

Diets of the poor in Bangladesh are dominated by rice. Thus, the phytate content of the meal is typically very high. Phytates chelate iron, thereby reducing iron absorption. An algorithm developed for calculating iron bioavailability in the presence of enhancers such as meat and vitamin C was recently extended in the nutrition literature to incorporate the inhibitory effects of phytates. This algorithm is used to calculate bioavailable iron in the diet, which is then used as an explanatory variable in modeling hemoglobin concentration.

Low Amounts of Bioavailable Iron in the Diet

Average iron intakes of women were estimated to be 6.93 milligrams per day (mg/d), of which only 0.33 mg/d came from meat, fish, and poultry (MFP). Plant foods, then, provide most of the potentially bioavailable iron in the diet. Fourteen percent of the heme iron from MFP was assumed to be bioavailable (0.05 mg/d of absorbed heme iron). Depending on assumptions about body iron stores and effects of phytates, bioavailable nonheme iron ranged from 0.80 mg/d (12 percent bioavailability) to 0.05 mg/d (1 percent bioavailability).

Adult women require 2 mg/d of absorbed iron. To assess the efficacy of alternative food policies, it is critical to know the actual iron absorption rates in undernourished populations. For example, if the body is capable of absorbing large quantities of nonheme iron because of low body stores (for example, a 12 percent absorption rate), then iron fortification of rice through plant breeding could be effective in alleviating iron deficiencies. By contrast, if the absorption rates are as low as 1 percent, higher intake of MFP or iron supplementation would be necessary for improving the iron status of adult women.

The models estimated for Bangladeshi women's hemoglobin concentration showed that bioavailable iron had statistically significant

effects when the enhancers were used in the calculations of bioavailable iron (Table 11.1). Coefficients of the bioavailable iron increased by 50 percent and were more precisely estimated when the effects of phytate intake were also taken into account. The coefficient for women taking iron supplements was also statistically significant. These regression coefficients may be used to evaluate the relative cost-effectiveness of alternative interventions.

Table 11.1 Regression estimates for Bangladeshi women's hemoglobin concentration in three survey rounds

Independent variable	Hemoglobin concentration (g/dL)			
	Fe enhancers only		Fe enhancers + inhibitors	
	Coefficient	SE	Coefficient	SE
Constant	1.720*	0.199	1.744*	0.193
Age ^a (years)	-0.021	0.018	-0.020	0.018
Pregnant (yes = 1; no = 0)	-0.048*	0.015	-0.047*	0.014
Height ^a (meters)	0.338*	0.134	0.337*	0.130
Mid-upper-arm circumference 2 (centimeters)	0.323*	0.022	0.318*	0.018
Weight ^a (kilograms)	-0.201*	0.023	-0.201*	0.020
Fe bioavailable ^a (mg/d)	0.011*	0.006	0.015*	0.006
Diarrhea with blood (yes = 1; no = 0)	-0.037	0.045	-0.038	0.044
Indicator for Fe tablets (yes = 1; no = 0)	0.026*	0.009	0.026*	0.009
Lagged dependent variable ^a (g/dL)	0.168*	0.060	0.172*	0.051
Between/within variance	0.472*	0.140	0.465*	0.121
Within variance	0.0089		0.0089	
2 (log-likelihood function)	6,769.95		6,772.08	
N	514		514	

Notes: Estimates are explained by anthropometric and morbidity variables and by the intake of bioavailable Fe assuming 0 mg body Fe stores. Values are slope coefficients \pm standard errors.

* indicates $p < 0.05$.

^aThese variables and the dependent variable were in natural logarithms.

Relative Effects of Diet and Iron Supplements on Blood Hemoglobin

An international effort to breed for micronutrient-dense staple food crops as a means to reduce micronutrient malnutrition has been ongoing since 1995. The most progress has been made for rice. Research under the micronutrients project of the Consultative Group on International Agricultural Research (CGIAR) suggests that the amount of iron in rice can be doubled using conventional breeding techniques while maintaining high yields. These varieties will thus remain profitable and be attractive to farmers.

The cost of plant breeding research is typically a one-time fixed investment of a few million dollars for one country for a specific crop and nutrient. For example, an *upper bound* for fixed developmental costs for iron-fortified rice for Bangladesh may be set at US\$6 million. The average intake of rice by women in our sample was approximately 500 grams per day (g/d). An improved rice variety might increase nonheme iron intake from 6.6 mg/d to approximately 10.6 mg/d. This would constitute an increase in bioavailable iron of between 0.04 mg/d (1 percent bioavailability of nonheme iron; a 40 percent increase in total bioavailable iron) and 0.48 mg (12 percent bioavailability of nonheme iron; a 56 percent increase in total bioavailable iron). Assuming that the improved rice variety would reach half of the Bangladeshi population (65 million out of 130 million) for 10 years, the cost of iron fortification of rice would amount to 1 cent per year for each person.

Regression coefficients show that the effect of iron supplementation in improving population hemoglobin is 3.5 times as strong as doubling the amount of iron in rice as just calculated. The cost per person reached using supplementation, however, is more than 100 times as high. The cost of supplementation is US\$1.70 per person per pregnancy.

It can be misleading to compare the costs of iron fortification through plant breeding and supplementation with the costs of increasing MFP consumption. MFP provides not only iron, but a range of nutrients and other compounds that are necessary for a balanced diet. Nevertheless, looking strictly at iron and using the algorithm for calculating bioavailable iron, the analysis shows that MFP consumption would have to triple to match the blood hemoglobin improvements brought about by the development of high-iron rice.

The costs of realizing such an increase in MFP would be substantial. Households in our sample spend 70 percent of their total expenditures on food, and 25 percent of the food budget is spent on MFP. This implies that

17.5 percent of total household expenditures are allocated to MFP. Tripling MFP consumption, then, would cost an extra 35 percent over present expenditures. Per capita total expenditures per year for our population are approximately US\$200/year. The increased MFP consumption would cost about US\$70 per year per person. These costs can be reduced by introducing new technologies to the livestock and fish sectors, improving productivity, increasing the supply, and lowering prices for MFP. MFP prices will never fall enough, however, to approach the cost-effectiveness of fortification or supplementation.

Policy Conclusions

Plant breeding holds great potential for providing a low-cost intervention that could help improve iron status broadly for populations with a high prevalence of iron deficiency. The degree of success will depend on the levels of minerals, vitamins, promoting compounds, and antinutrients that plant scientists are able to breed into high-yielding, profitable varieties of staple food crops. This breeding process, however, must be informed by human nutritionists, who can determine what breeding objectives will have the greatest nutritional impact. The precise answers that are required of human nutritionists will require further research, such as feeding trials using human subjects to determine the bioavailability of iron and zinc in nutritionally improved varieties.

Although plant breeding is cost-effective, it is only one of several interventions that are all required in tandem to reduce micronutrient malnutrition. Of those examined in this analysis, supplements are needed particularly in the short run when requirements are high (for example, pregnancy) or iron deficiency is acute. Promoting more rapid growth in production of MFP is likewise crucial. Prices of MFP, adjusted for inflation, have risen substantially over the past 25 years in Bangladesh at the same time as the inflation-adjusted price of rice has fallen by 40 percent. This trend, in addition to low incomes, explains why MFP consumption is so low and rice consumption remains high. MFP provides a range of highly bioavailable nutrients and other compounds that are essential to good nutrition. Production must keep pace with population growth and increases in demand due to higher incomes and urbanization, if prices of MFP are not to rise and cause a further lowering of consumption among poor households.

Intrahousehold Impact of the Transfer of Modern Agricultural Technology: A Gender Perspective

Ruchira Tabassum Naved

Micronutrient malnutrition is a serious problem in developing countries. It is well established that micronutrient requirements are greater for women and children because of their special needs for reproduction and growth. Unfortunately, however, women and children suffer most from micronutrient deficiencies. Micronutrient deficiency impairs the cognitive development of young children, retards physical growth, increases child mortality, and contributes to the problem of maternal death during childbirth.

Need for this Study

The intrahousehold distribution of micronutrients depends largely on the relative bargaining power of household members. In the context of asymmetry in gender relations, the distribution of micronutrient-rich and costly food is most likely to favor the male members of the household. This likelihood calls for intrahousehold analysis of the gender-differentiated impact of programs that seek to improve the micronutrient status of the poor and promote production of micronutrient-rich food.

For details, see Naved (2000).

Purpose and Methodology of the Study

This chapter is based on a qualitative study of the intrahousehold impact of the transfer of modern agricultural technology in Bangladesh from a gender perspective (Naved 2000). With a goal of obtaining results rapidly and at a low cost, the study compared the effects of agricultural programs targeted at improving women's household income. First studied was the commercial production of improved varieties of vegetables developed by the Asian Vegetable Research and Development Center and adapted by the Bangladesh Agricultural Research Institute. This technology is disseminated by a nongovernmental organization (NGO) named Gono Kallyan Trust (GKT) in Saturia. Second was the polyculture fish technology developed by the International Center for Living Aquatic Resource Management (ICLARM) and disseminated by the Fisheries Research Institute and the Danida-financed Mymensingh Agricultural Extension Project in Mymensingh. The same technology is disseminated in Jessore as well by Bachte Shekha (BS), a local NGO.

The study sought to assess the "emic" perspective on four questions: (1) Has income been increased from the implementation of new technology, and if so, who controls the additional income generated? (2) Has micronutrient-rich food intake increased as a result of the transfer of new technology, and if so, how are these foods distributed by gender and what are the factors that explain the distribution pattern? (3) How are other benefits from implementation of new technology distributed within the household and across gender? And (4) What is the impact of the implementation of new technology on gender relations?

Results

This study found that for most women income gains from adoption of the improved vegetable seeds were not substantial. Moreover, even though women were targeted for the project, their ability to benefit was limited for several reasons: the land tenure system is not in their favor; and the strict enforcement of *purdah* means that women cannot cultivate the land themselves, negotiate directly in the market for labor and other inputs, or sell the produce themselves. Thus, their male representatives gain de facto control over the land and its produce. Second, the gender division of work space between men and women validated by the system of *purdah* does not allow women to grow vegetables in the cultivable land owned by the family.

Some women ended up implementing the new technology in their homesteads, which is the traditional domain of female activities. Thus, production of the improved vegetables did not contradict traditional norms nor challenge the existing gender division of labor and work space. Another implication is that because use of the new technology was limited to the homestead plots, the resulting production and income were both quite small.

The adoption of fish production technology by women's groups appeared to promise better results in challenging the gender division of work space. The internalization of this division by women, however, still hinders use of this opportunity, which is apparent from the fact that they were reluctant to increase the size of the operation if it would require a substantial increase in their mobility and make them work farther away from their houses.

The improvements, however, depended on how the programs were structured. In one village ownership of ponds was transferred to individual women, and in another, to groups of women. Though the income earned by an individual woman was by no means greater than that earned by those implementing the improved vegetable technology, the fishpond project had some important advantages. First, it encouraged groups of poor women to actively participate in the production, effectively involving men at different stages but never ceding control to men. This was because the "negotiation" took place at a higher level than the household—men had to negotiate with groups of women who were backed by an NGO. Thus, men did not have direct access to the income.

Another important dimension of the fish production by groups of women is that it challenged the traditional gender division of labor and work space. Involvement of women in production outside the home initially met with negative reactions from the community, but when the project proved successful in bringing a financial return, women's position within households and communities was strengthened.

The periodic sale of fish brought in an income that is not negligible for a rural woman. In contrast to the vegetable growers, who tended to spend their small earnings instantly, the women who raised fish usually saved the amount and used it for investment or emergency purposes.

Analysis and Recommendations

The success of the fishpond project was largely due to the group approach in project implementation. In fact, in male-dominated societies where women have extremely limited access to internal or external support networks,

targeting programs to women as individuals without providing an alternative source of support is bound to fail in its gender goals.

In the projects studied in this chapter, when intrahousehold dynamics were disregarded in the design of the program, women were minimally involved and the projects soon became fully controlled by men. Moreover, at times women were found to be providing labor input into the project without directly gaining any benefits. Greater care is needed to ensure that development interventions do not lead to increased male control of female labor and earnings.

While fish cultivation did have benefits, it also clearly failed to improve the traditional pattern of intrahousehold food distribution, which continued to favor males. The scale of fish production was not large enough to allow females to consume this food after the males had had enough. The projects promoting the adoption of improved seeds and vegetables did lead to increases in the intake of micronutrient-rich vegetables by women, but this was mainly due to the intrahousehold dynamics of food distribution whereby women tend to consume the bulk of low-status food. (The vegetables were not perceived to be as tasty or as desirable as more traditional vegetables.) Although group-based fish production does not immediately result in increased intake of micronutrient-rich fish by women, it still seems to be an effective strategy in the long run, because it earns more income over which women have greater control, it strengthens women's position, and it may provide them with greater access to micronutrient-rich food in the future.

Resource Allocation and Empowerment of Women in Rural Bangladesh

Bénédicte de la Brière, Kelly Hallman, and Agnes R. Quisumbing

The bargaining power of men and women crucially shapes the resource allocation decisions households make (Quisumbing and de la Brière 2000). Husbands and wives often use their bargaining power to express different priorities about how resources should be allocated. Understanding these differences and their effects is critical if policymakers are to improve livelihoods. Increasing the bargaining power of one gender group rather than another can mean the difference between policy failure and policy success.

Like their counterparts in many other parts of the world, rural Bangladeshi females face severe discrimination (Hallman 2000). For example, as the proportion of women and preschool girls in a household increases, the household's food expenditure share decreases. Similarly, the share of household expenditure going to health decreases as the proportion of elderly women, as opposed to elderly men, increases. Boys are twice as likely as girls to be educated in rural Bangladesh.

These allocation outcomes can be altered through a large range of policy options that empower individuals by improving access to common property resources, credit, public works schemes, and legal and institutional rights. The group-based economic empowerment promoted by the Grameen Bank is one model that has been followed in Bangladesh. Nongovernmental

For details, see Quisumbing and de la Brière (2000) and Hallman (2000).

organizations (NGOs) have often gone beyond economic empowerment by emphasizing legal rights, political participation, and contraceptive use. All these and other means of empowerment affect the bargaining position of men and women within households.

To study how bargaining power affects decisionmaking in Bangladesh, the International Food Policy Research Institute (IFPRI) used household survey data drawn from a larger study of the impact of technology adoption conducted by IFPRI, the Bangladesh Institute of Development Studies, and the Institute of Nutrition and Food Science, University of Dhaka, in 1996. The household survey covered 47 villages in three sites in Bangladesh: Saturia, Jessore, and Mymensingh. In the first two sites, technologies are being introduced through NGO programs targeted exclusively to women, who are provided training and credit. At the third site extension agents provide training to relatively better-off households and training with credit to relatively poorer households. The agents target both men and women, but men more often than women. From the entire sample of almost 1,000 households, individuals from 826 monogamous households with intact marriages were interviewed about the assets they owned at the time of and during marriage and about their parental backgrounds.

How Much Do Men and Women Own at Marriage and during Marriage, and What Determines Their Level of Assets?

Assets at the time of marriage are an attractive indicator of bargaining power because they represent the most important occasion of wealth transfers to the couple by their parents during their lifetime and because such assets have significant symbolic value over and above their economic value. Both ownership of current assets and the assets men and women bring to their marriage thus indicate degrees of bargaining power.

Survey data reveal that female premarital assets are much less valuable than male. Brides mostly bring food and durables to the marriage. Cattle accounts for the bulk of male premarital assets, and land, seldom owned before marriage, generally accounts for the smallest proportion. Grooms with education past primary schooling own more valuable assets at marriage, but, strikingly, a bride with more than primary schooling seems to own less valuable assets. A bride whose in-laws have larger landholdings than her parents do brings more valuable assets to marriage, but no such relationship holds true for the groom. The characteristics of the origin families strongly

determine assets at marriage and current assets. Parents' landholdings, in particular, influence both asset measures, suggesting that extended families not only arrange marriages, but may also have substantial influence on outcomes within marriages.

On average, wives' total current wealth represents only about 10 percent of household wealth, with land being the most unequally distributed asset. Women generally do not inherit land or give it up to their brothers if they do. Husbands' and wives' assets at marriage do not seem to bear any significant relationship to their current assets, though parents' assets do determine the assets of their respective married children. The number of brothers a wife has and the level of education her husband has attained both influence the wife's level of current assets.

How Do Assets at Marriage Affect Household Decisionmaking?

Even in a patriarchal society where husbands control most of the resources, husbands' and wives' assets do differ and, accordingly, their ability to prioritize particular allocation outcomes differs as well. Husbands and wives deploy the bargaining power that comes with ownership of assets at and during marriage to different ends. Women's assets at marriage, for example, have a positive and significant effect on children's clothing and education expenditures; they also reduce the morbidity of girl children. Husbands' assets at marriage significantly (and negatively) affect expenditure on fuel. Higher dowry payments to men, however, reduce child morbidity, regardless of sex. The latter result is consistent with the findings of other studies that show lower dowry payments increasing wife-beating and reducing child caloric intake.

What Role Do Current Assets Play in Household Decisionmaking?

Husbands' current assets have a positive effect on food expenditure and a negative effect on expenditure on men's and women's clothing, services, durables, and personal care. Women's current assets continue to be positively associated with expenditure on children's clothing and education.

A closer look at the surprising positive relationship between men's assets and expenditure on food reveals that men's current assets positively influence

spending on cereals. The reverse holds true for women. But neither men's nor women's assets influence expenditure on plant- and animal-based food products. Women and men may well have similar preferences when it comes to purchasing the latter food products. These results may point to factors specific to Bangladesh. In several other countries where women's assets positively influence food expenditures, women are responsible for food crop production or have independent sources of income. In Bangladesh, however, men control the production and marketing of rice, the major staple, and they also purchase most of the food.

In terms of health, the higher the mother's current assets, the greater the reported illness days for boys. The reverse is true in the case of the father. Extended families play an important role in child health. The number of living brothers that the mother has positively influences the health of both boys and girls. This finding reflects the cultural practice of females' transferring their inheritance to male siblings in exchange for future brotherly support for themselves and their children.

Implications for Policy

These findings show concretely that the identity of the transfer recipient will affect the outcome of a policy intervention. According to the study, improving a woman's bargaining power and access to resources will increase household expenditure on children's education, but improving the same for a man generally will not. Increasing maternal control over household resources should improve the health of girl children. Given that women in Bangladesh face disadvantages with respect to both asset ownership and education, it is possible that the greatest impact of interventions that increase resources under women's control will be felt by the next generation.

Although one could easily recommend transferring assets to women, programs designed to increase assets held by women should first investigate the likely consequences of such transfers on intrahousehold relations. Different assets may have different implications for bargaining power if "status" or prestige is attached to a particular asset. Individuals may also act in compensatory (or even retaliatory) fashion when receiving assets. Some Bangladeshi women have borrowed on behalf of their husbands when given greater access to credit. Even more disturbing is the possibility of increased domestic violence toward women if income transfer programs were to radically alter the distribution of power between husbands and wives. A study of women participants in microcredit schemes in Bangladesh, however,

reports an overall reduction of the incidence of violence against women (Schuler et al. 1996). Women's participation in the expanded set of social relationships due to membership in credit organizations, rather than their economic contribution per se, explains most of the reduction in domestic violence. With these words of caution in mind, the significant differences found in the asset positions of rural Bangladeshi men and women warrant interventions that increase women's assets relative to men's.

Does Cash Crop Adoption Detract from Childcare Provision? Evidence from Rural Nepal

Michael J. Paolisso, Kelly Hallman, Lawrence Haddad, and Shibesh Regmi

Reduction of rural poverty is one of the greatest challenges the Government of Nepal faces. Since most of the country's agricultural production is semi-subsistence-oriented, increased commercialization of this rural-based economy is essential for poverty reduction and economic growth. Consequently, farm output diversification and productivity improvements are high-priority areas for the government.

Purpose of this Study

Despite a conceptual literature on gender and development that provides the scope for a focus on both men and women (Moser 1993; Cornwall 1997; Engle 1997; Paolisso, Gammage, and Casey 1999), few quantitative studies examine how men and women respond to new economic opportunities in rural areas. Some case studies infer that women's individual productivity and access to resources decline as households increase commercial crop production (Braun and Webb 1989; Buvinic and Mehra 1990). Others indicate that commercialization is not necessarily associated with increased workloads for women (Bellin 1994; Bouis and Haddad 1994; McComb et al. 1994; Peters and Herrera 1994). Very few studies examine the changing activity patterns of both men and women in response to commercialization

For details, see Paolisso et al. (2002).

of agriculture. And even fewer collect rigorous time allocation data on these patterns.¹

Though women's time is valuable in agriculture, it is also valuable in the production of child nutrition. The past 10 years have seen a revolution in the conceptual model underlying child malnutrition. Specifically, there is now a recognition that care of children is at least as important to their growth and nutritional status as are food intake and health. Care behaviors include breast-feeding, psychosocial stimulation, food preparation and storage practices, and hygiene practices (Engle, Menon, and Haddad 1999; Ruel et al. 1999). This evolution in thinking about the causes of child malnutrition warrants further analyses of the time trade-offs that women and men face when adopting new agricultural technologies.

This chapter (Paolisso et al. 2002) uses data from fieldwork conducted in Nepal to examine the impact of a project designed to commercialize vegetables and fruits—the Vegetable and Fruit Cash Crop (VFC) program—on male and female time allocation. We use a rigorous time collection methodology to profile the activity patterns of men and women in households that adopt and do not adopt new vegetable and fruit technology. We model the adoption decision and estimate the impact of adoption on men and women's time allocation patterns in various key activities.

Nepal's Vegetable and Fruit Cash Crop Program

The findings are based on fieldwork completed in 1991–93 in the Rapti Zone, Mid-Western Development Region, Nepal. Beginning in the late 1980s, farmers—men and women—throughout Rapti were encouraged to commercialize their vegetable and fruit production to generate income and meet growing demand for fruits and vegetables. Development assistance was provided by the Rapti Development Project (1985–95). Within the project's focus on agriculture, the VFC program was developed to focus exclusively on vegetable and fruit commercialization.

The overall goal of the VFC program is to increase the commercial value of the vegetable and fruit production and raise household incomes of targeted farmers. The VFC program provides production inputs, training, and technical assistance to both men and women farmers. The specific vegetables and fruits provided vary according to agroclimatic conditions and existing agricultural practices.

¹For recent exceptions, see the collection of studies on women and agricultural commercialization in Spring (2000).

Methodology

At the time of the fieldwork the VFC program was active in 22 communities in the five districts in Rapti. Three were selected as representative of the diversity of the communities in terms of ethnic composition and differences in agro-ecological and market conditions. The VFC program provided technical assistance and crop technologies to the three communities at a level sufficient to achieve demonstrable results in a relatively short time.

A total of 264 households were randomly selected using a two-stage sampling procedure. VFC households are defined as meeting any of the following criteria: (1) received training through the VFC program and are actively using the improved technologies to grow vegetables, fruits, and other cash crops for local markets; (2) received training through the VFC program and are actively using the improved technologies to grow vegetables, fruits, and other cash crops for home consumption only; or (3) received training through the VFC program and are using the improved technologies to grow vegetables, fruits, and other cash crops to a moderate degree.

A number of data collection techniques were used to obtain qualitative and quantitative information on the production and consumption patterns of households participating and not participating in the VFC program in the three communities. The principal approaches were survey questionnaires, random spot observations of time allocation, ethnographic techniques, and rapid rural appraisals. One innovation of this study is the combination of socioeconomic data with detailed time allocation data collected through the use of repeated random-spot observations.

The random-spot observation for time allocation data collection involves recording the activity of individuals within the 6:30–18:30 time period by visiting them randomly 30 times during the course of a 12-month period and observing and recording their activity. By focusing on these daily hours, we capture activities that are directly and indirectly affected by changes in farming practices due to the adoption of VFC technologies, including agricultural labor, childcare, food preparation, and fuel and water collection.

Results and Discussion

Our analysis focuses on three related questions. First, what are the determinants of household participation in the VFC program? Second, how does head male and head female mean time allocation among various activities differ by VFC participation status? And third, how does VFC

participation affect head male and head female labor allocation to various activities while controlling for a number of individual and household characteristics?

Participation in the VFC program is increased by having a literate household head, by being located closer to the VFC extension office, and by community acceptance of the program.² Before the program, the households grew small amounts of vegetables and fruits for home consumption. The varieties grown and the technologies used, however, did not produce vegetables and fruits of the quality and variety that would make them commercially viable. The VFC program was successful in its efforts to target both men and women farmers; household participation in the VFC program resulted in increased head male and head female time spent growing vegetables and fruits.

In response to VFC, head women allocated 55 to 3 minutes per 12-hour period to vegetable and fruit production for households with one, two, and three preschoolers, respectively (Table 14.1). VFC participation increased head male time in vegetables and fruits more than for head females (head male time allocation ranges from 64 to 24 minutes). These responses are large, given that they are averages over one year.

For the 101 households with more than one preschooler, VFC participation results in increased time—for both men and women—to vegetables and fruits; less time to cereals and livestock; and greater time to care of children under five years by women and moderately less time to care of children under five years by men. For these households the trade-offs associated with VFC participation do not seem too important for the care of children under five years.

For the 67 households with one preschooler, the trade-offs seem more important. In these households preschoolers receive less care from their

²Probit regression analysis was used to estimate the likelihood that a household would have received VFC training. Explanatory variables were selected on the basis of being identified as important in ethnographic analysis of VFC participation, including age and literacy of the household head, household size and composition, ownership of assets, and time required to reach the local VFC field office. This last variable is used as an identifying instrument in that we assume it affects whether VFC training is received, but not the labor allocation decisions between VFC and non-VFC crops, other than through VFC training. Using these variables, we predict the likelihood of VFC participation for each household. Predicted VFC participation is then included as an exogenous explanatory variable in the analysis of the determinants of the allocation of male and female time to VFC activities and to cereal and livestock activities.

Table 14.1 Impact of VFC participation on head male and female time, by the number of children aged 0–4.9 years

Activity	Marginal impact (in minutes) of VFC participation for:					
	Head males			Head females		
	1 child	2 children	3 children	1 child	2 children	3 children
Vegetable and fruit cultivation	64	44	24	55	29	3
Cereals and livestock	-19	-114	-209	64	-38	-140
Care to children under 5	-64	-33	-2	-77	4	85
Leisure	-8	88	184	0	0	0

parents, who spend more time in cultivation activities, especially in the cash crop, but also in the food crop. Is there scope for a behavior change intervention such as a communications program to increase time by parents in care for preschoolers in this vulnerable set of households? We note that the nonwork (leisure) time of men increased as a result of VFC participation, but for women, leisure time was unaffected. Thus in the short run it may be possible to protect childcare time by reducing time to leisure. This is not to say that leisure time is unimportant, particularly for the women upon whom the preschoolers primarily depend, but at least VFC participation has not increased overall work time burdens.

In the medium run, benefits may well accrue to unborn preschoolers if VFC participation empowers women. Although the incomes earned from the local sale of VFC products are quite small, they represent the first opportunities women have had to earn and retain income without leaving the community. This change may have far-reaching impacts on women's ability to exert their own preferences in a wide range of activities—including an increased allocation of resources to children. The current data set does not permit a longer-run analysis of the impacts of this agricultural technology and training on the nutrition status of preschoolers, but future data collection efforts in this area of research should strive to do so.

Changes in Intrahousehold Labor Allocation to Environmental Goods Collection: A Case Study from Rural Nepal, 1982 and 1987

Priscilla Cooke St. Clair

This study explores the impact of changes in environmental conditions on household labor allocation to the collection of environmental goods such as fuelwood and leaf fodder for a sample of rural Nepali hill households. Households in rural areas of most developing countries often rely heavily on the surrounding environment for goods such as water, wood, and livestock fodder. Frequently these and other environmental products are collected from local common forestland, a task that in many areas is predominantly carried out by women. Given the increasing pressure on biomass resources in many developing areas and the common gender division of collection labor, there is concern that women in particular will bear the burden of increases in resource scarcity by having to spend more labor time and effort to collect forest products.¹

This concern appears to be a particularly valid one in the hill region of Nepal, where women may spend several hours per day collecting fuelwood, water, and cut grass or leaf fodder for livestock and growing populations are exerting more pressure on commonly owned forest resources. Studies using Nepal data from 1982/83 reveal that households respond to the increasing costliness of environmental goods, at least in the short run, by consuming

For details, see Cooke (2000).

¹See, for example, Cecelski (1987). See also Agarwal (1986), Dankelman and Davidson (1988), and Dasgupta (1993) for discussions of women and environmental good collection.

less of them and devoting more female labor to their collection (Kumar and Hotchkiss 1988; Cooke 1998). An important line of questioning is whether this is still the case after enough time has passed for households to undertake other responses to the costliness, such as planting trees on their property. A related question is whether women's labor burdens will be lightened more than those of men and youth if local common environmental resources are improved.

In order to address these questions, this study examines changes in intrahousehold labor allocation to the collection of environmental goods over time and in response to changes in local environmental conditions for a sample of Nepali hill households. An empirical analysis of the changes in labor allocation patterns and how these relate to changing environmental conditions will contribute to a greater understanding of how policies that influence the environmental resource base may influence the welfare of different groups within households. This issue is of particular interest in Nepal, where much policy emphasis currently is being placed on local forest resource management for the improvement of local common forest resources.

Households and Forest Resources in the Hills of Nepal

The data used in the analysis are from household surveys conducted in 1982/83 and 1997 in six villages in three hill districts of Nepal. This study has the advantage of resurveying the same households after a 14-year period that allows for an assessment of the effects of environmental changes over time. Common forest resources in the survey sites have changed over this period: some for the better, some for the worse. Additionally, although two of the survey sites had some community forestry management in 1982/83, all sites with a community forest now have a formal forest user group (FUG). In 1993 Nepal passed the Forest Act, which recognized local FUGs as institutions with property rights over community forests. Management by FUGs generally involves restricting what can be taken out of the forest and exacting penalties on those who break the rules, although what the local FUGs do in practice and how effective they are varies between sites.

The households in the survey villages are mostly small-scale agriculturalists producing primarily for home consumption. Almost all of the households in the sample own their own farmland, although average landholdings dropped significantly between 1982 and 1997. Most of the sample households also own some combination of goats, cattle, and water

buffaloes. Hill households traditionally have relied extensively on local common forest areas for fuelwood, water, leaf fodder, and grass. Most energy consumption comes from fuelwood, which is primarily used for cooking. Water is collected for household consumption. Leaf fodder and cut grass are important sources of livestock feed and are seasonal in nature. Cut grass is the preferred livestock feed, but it is generally available only in the monsoon season. In the dry season households rely on leaf fodder. Collecting fuelwood, grass or leaf fodder, and water can take up many hours of a household's time in a day. The bulk of this time typically comes from adult women in the household. The rest of the household collection time comes from adult men or from older children.

Results

This analysis of the effect of forest resource scarcity on household collection and consumption of environmental goods shows that households in relatively worse environmental conditions consume less of the environmental goods and spend more time in their collection.² In contrast to earlier studies, this study finds that the increase in collection time comes almost equally from men and women (Table 15.1).³ Higher collection times for both men and women are also associated with community forest management variables.

²This study estimates household-level reduced-form demand equations for environmental goods and for the time allocated by different household groups (men, women, and youth) to environmental goods collection. This study has the advantage of using panel data that allow for an assessment of changes over years and seasons. Measures for forest management practices include a dummy variable for whether a ward has instituted community forest management and the number of years community forest management practices have been in place. Measures of forest resources include the area under forest cover as well as measures of forest resources available to the households in the sample. Explanatory variables also include age of the household head, dummy variables for caste and ethnicity, land- and livestock ownership, remittances, and pension payments. Finally, ward-level dummy variables and seasonal dummy variables are also included to capture the effects of any unobserved fixed ward-level factors and seasonality, respectively. The analysis also examines and corrects for possible sources of bias in the estimation, which include the possibility that certain groups within a household (especially men and youth) may not devote any time to environmental goods collection, that households may choose not to collect a given environmental product, and that households choose the place of collection.

³Only the table of descriptive results is presented here; the description of the rest of the results is based on Cooke (2000).

Table 15.1 Household collection time for environmental products, by season and year

Variable (minutes per day)	Late dry season			Monsoon season				
	% of sample 1997	collecting	% of sample 1982/83	collecting	% of sample 1997	collecting	% of sample 1982/83	collecting
Total collection time								
All household members	382.83 (252.54)	100	341.45 (265.97)	100	423.26 (286.17)	100	570.42 (310.69)	100
Men	131.01 (115.07)	60	45.51 (52.20)	73	152.98 (144.07)	68	160.30 (147.26)	46
Women	271.73 (208.93)	100	296.50 (254.32)	100	241.88 (169.03)	98	432.88 (223.78)	98
Children	115.53 (109.53)	37	21.70 (31.94)	54	153.82 (134.50)	55	153.24 (115.66)	84
Total collection time for								
Fuelwood	160.74 (147.71)	93	101.79 (93.53)	100	42.95 (45.64)	37	157.95 (152.93)	74
Water	185.01 (169.01)	98	139.67 (134.93)	100	101.28 (99.91)	94	129.47 (133.47)	99
Leaf fodder	65.47 (91.47)	54	109.43 (94.43)	75	96.09 (73.3)	24	n/a	n/a
Cut grass	132.50 (55.61)	13	216.80 (110.22)	8	315.53 (247.73)	95	352.47 (257.57)	92

Sources: Nepal Energy and Nutrition Survey, 1982/1983, Western Region, Nepal, Nepal Agricultural Projects Services Center, the Food and Agriculture Organization of the United Nations, and the International Food Policy Research Institute; and Nepal Household Resurveys, 1996/1997, the International Food Policy Research Institute, U.S. Agency for International Development, Goteborg University, Sweden, Winrock International-Nepal, and author's fieldwork.

Notes: These statistics were based on households in both the Nepal Energy and Nutrition Survey, 1982/1983 and the 1997 survey. Sample sizes vary owing to data availability. Means are for collecting households only. Standard deviations are in parentheses; n/a = not available.

Another finding of this study is that household collection burdens were significantly lower in 1997 than in 1982. Household women as a group have seen the largest decrease in their time spent collecting.

Encouragingly, the time it takes to collect a unit of fuelwood or leaf fodder has decreased between the two years, accounting for part of the decrease in total collection time. The picture is not an entirely rosy one, however, because consumption of environmental goods was also significantly lower in 1997 than in 1982. It appears that lower per-unit collection times are due to households' collecting more from their own property rather than to higher community resource availability. More than half of the sample households said that they had planted trees on their property over the 14-year period, many of which were specifically planted for fodder, and more than 80 percent allowed trees to grow up naturally. Further analysis shows that there is a substitution of private for common resource use as FUG rules or deforestation cause the common resource to become more scarce. Households in areas with a smaller community forest are significantly less likely to collect fodder and fuelwood from the community forest than households with a larger community forest. Similarly, households in areas with a FUG that enforces its rules are much more likely to collect fodder from their own property.

Conclusions

The results taken together show that collection labor burdens in the survey areas have decreased over time, especially for women, but that one should not hastily attribute decreases in collection time to successful forest rehabilitation in areas managed by forest user groups. In this case it appears that lower collection times are principally due to reduced consumption and increased collection from private land. This study provides empirical evidence that using one's own land to produce fuelwood and fodder is an important coping response to scarcity of community forest resources for hill households. Of course, growing trees on one's property is usually not a costless option, given the competition for space for crops, and it is obviously not an option at all for households who do not own any land. Thus the poorest households in a community are likely to bear the highest costs of environmental degradation, at least in terms of the labor burden required for collection.

PART 3

Health and Nutrition

Health and Nutrition: Overview

Agnes R. Quisumbing

Gender differences in health and nutrition have long been a subject of study in the intrahousehold allocation literature. Unlike consumption expenditures or farm production, measurements of health and nutritional outcomes are always at the individual level, and thus factors that underlie systematic differences in outcomes—such as age, gender, and position within the household—are more readily apparent.

Despite assumptions that household gender bias is a widespread nutrition and health problem for women in developing countries, most evidence in support of gender bias comes from South Asia, Southeast Asia, and some parts of China (Strauss and Thomas 1995; Haddad et al. 1996; Marcoux 2001). The literature suggests that in South Asia, the bias against females is attributable to the dowry system, which requires families to pay bridegrooms to marry their daughters. Indeed, the evidence indicates that discrimination against females is greater in higher-income families than among the poor. Conversely, studies in Sub-Saharan Africa, where the culture requires bridegrooms to pay a bride price, show that daughters are slightly more nutritionally favored than sons. Overall differences outside the Indian subcontinent are slight, and apparent favoritism toward adult males is explained by greater energy expenditures required for male agricultural workers and by the failure of researchers to account for children's snacking outside the home. Similarly, household studies on access to health care showed not much gender difference in most regions, again with the exception of South Asia.

Does gender inequality in health and nutrition outcomes persist over generations? The evidence for continuing gender bias is mixed—it seems to

be disappearing in those countries that have time-series data (Marcoux 2001). Moreover, Demographic and Health Surveys in 36 developing countries with data on weight-for-age Z-scores of boys and girls do not show significantly better nutritional outcomes for boys, with the exception of Bangladesh and Nepal (Smith et al. 2003; Chapter 6).

What does the new research on intrahousehold allocation tell us regarding gender differences in health and nutritional status? Although studies attempting to explain the “Asian Enigma” (Smith et al. 2003; Chapter 6) have highlighted the importance of women’s status as a factor underlying higher child malnutrition rates relative to Sub-Saharan Africa, the analysis does not tell us whether higher women’s status leads to better outcomes for girls rather than boys. A further test of the unitary model of the household with respect to health and nutrition outcomes would involve testing whether resources controlled by men or by women had differential effects on children depending on their age or gender. Other factors affecting intrahousehold allocation, such as the extended family, community, and other social groups, also need to be examined. Moreover, gender may not be the only determinant of health and nutrition: household structure and one’s position within the household may well be important influences as well.

The three chapters in this section extend our understanding of health and nutrition outcomes in the ways mentioned. The chapter by Hallman examines the impact not only of assets held by men and women, but also of transfers at marriage and the extended family on the morbidity of boys and girls in rural Bangladesh. The chapter by Maluccio, Thomas, and Haddad attempts to explain the surprising result that maternal absence is correlated with better nutritional outcomes of young children in the rapidly changing environment of South Africa after the abolition of apartheid. Finally, the chapter by Hoddinott and Kinsey investigates the factors—including position within the household—that explain the extent to which adults are able to cope with drought-related risk in rural Zimbabwe.

Contributions of Each Chapter

Chapter 17 is a test of the unitary model of the household on child health outcomes, with modifications that reflect the cultural context of Bangladesh. It tests the impact of differential control of resources by mothers and fathers on child health. Measures of resource control include the maternal share of current assets, the maternal share of premarital assets, and the maternal share of marriage payments. Mother’s assets are generally more beneficial for girls,

and father's for boys—a result consistent with much of the literature on intrahousehold allocation (for example, Thomas 1990, 1994). The consideration of marriage payments and the role of the extended family is a feature that sets this study apart. A greater share of marriage payments directed toward the husband appears to reduce child morbidity, regardless of child sex.

While this may seem counter to the literature that suggests that increasing resources controlled by women improves child health, these results are consistent with other findings in South Asia (Rao 1997), which reveal that lower dowries increase wife-beating and reduce child caloric intake during marriage. This situation suggests that attempts to abolish dowries through legislative means may backfire unless we fully understand the mechanisms through which marriage payments operate. In India, when the dowry system shifted from a familial obligation to provide a share of family property to daughters at marriage to a *de facto* right of the bridegroom's family to demand compensation, the Dowry Prohibition Act was passed (1961). Although the law did not ban dowries, it prohibited gifts given or taken in consideration for marriage. Unfortunately, it also reduced the willingness of families to provide property to their daughters at marriage, while maintaining preferential rights of male members of joint families over inherited properties. In the end, daughters' claims to family property were severely weakened (Gopal 2001).

Another feature that is important in South Asia is the role of the extended family, especially the mothers' brothers. A larger number of living brothers reduces child mortality. Again, this is consistent with the practice of sisters' giving up their share of their inheritance in return for fraternal support. Although it is tempting to criticize this practice as unfair toward women, in the absence of other social networks or risk-coping mechanisms, this practice is perhaps a woman's only guarantee of support from her male relatives.

Maluccio, Thomas, and Haddad use panel data from a province of South Africa to examine the effects of changing family structure on child nutritional outcomes. The authors take advantage of repeated observations on children within the same household before and after the dismantling of apartheid to isolate the effect of household structure—specifically the presence or absence of the father or mother—on child nutritional status.

Aside from the authors' careful econometric approach, an important component of this study was the definition of the household in the household survey. To account for the complexity of the South African situation with its history of residential restrictions and migrant labor, a two-tiered definition for household members, resident or nonresident, was

formulated based on time spent in residence. This distinction between resident and nonresident household members, plus careful tracking of former residents who had migrated, was key to understanding the changes in household structure after residential restrictions were lifted.

The study's findings are surprising: father's presence does not seem to affect child nutritional status, and, in contrast with the evidence in the developed world, children whose mothers are absent seem to do better than children with coresident mothers. The authors attempt to explain these results by positing that migrant mothers are better able to take advantage of new opportunities and are able to remit their incomes, thereby providing resources for their children. Similar to the results from Bangladesh, the finding suggests that the extended family is an important influence on child well-being; in fact, it is able to substitute very well for the mother.

Finally, the chapter by Hoddinott and Kinsey summarizes work that is part of the growing literature on the differential risk-coping ability of individuals within the household (for another example, see Dercon and Krishnan 2000). The study investigates the impact of drought between 1994 and 1997 on the body mass index (BMI), defined as weight in kilograms divided by height in meters squared, of adults in three resettlement sites in Zimbabwe. Drought reduced women's BMIs by 1.15 percent for every 10 percent negative deviation from long-term average rainfall, whereas men were not affected. Although women were more vulnerable than men to drought shocks, the drought did not hit women equally. The impact of drought differed, depending on household wealth and one's position within the household. Women in poor households were more severely affected by drought, and daughters of the household head, who represent a drain on parental resources in this culture, were worse off compared with other women. This finding suggests that intrahousehold allocation outcomes are an issue not only of gender, but of how gender may interact with other factors that affect relative status within the household. Understanding these factors that interact with gender may be crucial in identifying vulnerable groups and designing appropriate safety net interventions for them.

Key Messages

1. Increasing maternal control over resources within marriage improves the health of children, especially girls. A higher degree of female command over household wealth may encourage parents to invest more in daughters in the next generation. The extended family may provide additional

- resources to improve child health and should thus be considered an important factor affecting child health.
2. Household structures may evolve as an effective coping strategy for household members. Attempts to intervene in household structure in the interest of family reunification or other social objectives may have unintended consequences on child health.
 3. While women's nutritional status may be affected by drought shocks more than men's, women do not bear the effects equally. Women in poor households and those with an unfavorable position within the household are more likely to be worse off. Asset ownership may serve as an important ex ante consumption-smoothing mechanism that protects women. Public safety nets must be targeted toward those who are not able to protect themselves through ex ante coping strategies.

Mother-Father Resources, Marriage Payments, and Girl-Boy Health in Rural Bangladesh

Kelly Hallman

Agrowing body of literature suggests that men and women allocate resources under their control in systematically different ways. Studies examining the effect of women's income on household expenditure patterns find that women typically spend a higher proportion of their income on food and health care for children, as well as other goods for general household consumption, than do men.¹ Other evidence from developing countries shows that female income more often has a greater impact than male income on infant and child survival probabilities, preschooler nutrition, and child education (Doss 1997; Thomas 1994).

An issue related to intrahousehold allocation is that of gender bias. A number of studies addressing this topic have focused on the intrahousehold distribution of nutrients. Evidence shows that pro-male bias in nutrient allocations exists in South Asia. Boys here are also more favored in the distribution of nonfood health inputs, such as health care. Furthermore, this is the only area of the world in which girls have higher child mortality rates than boys.

Only infrequently has an analysis of gender bias been combined with an examination of bargaining power in the household. The value-added of such an exercise is the opportunity to examine the impact of male and female resource control within the household on the well-being of different members of the household.

For details, see Hallman (2000).

¹See, for example, Guyer (1980), Dwyer and Bruce (1988), Garcia (1991), Kennedy (1991), Katz (1992), Thomas (1994), and Thomas and Chen (1994).

For this study, household survey data from 47 villages in three rural areas in Bangladesh are used. These data were collected in 1996–97 by the International Food Policy Research Institute (IFPRI), the Bangladesh Institute of Development Studies (BIDS), the Institute of Food and Nutrition Science, Dhaka (IFNS), and Data Analysis and Technical Assistance (DATA) as part of an impact evaluation of new agricultural technologies being disseminated in the three areas (Manikganj, Jessore, and Mymensingh Districts) (Bouis et al. 1998). Besides detailed information on agriculture and nutrition, the survey also contains data on individual current asset holdings, premarital assets, marriage transfer payments, and family background characteristics for husbands and wives.

With this unique data, this study examines the impacts of the resource control pattern within the household on girl and boy morbidity in rural Bangladesh.

Measures of Parental Resource Control

Bargaining models suggest that women with more assets, income, or education have greater bargaining power in the household because they have more options outside of the household; therefore, their “threat points” in the household are greater.

In any setting, however, cultural factors influence the ability of women to obtain and wield discretionary control over the factors that make up these threat points. In rural South Asia, for example, social norms influence what is acceptable regarding female movement in society; this, in turn, affects women’s ability to earn income and exercise control over property. Even if a woman has education, it may not serve her in the labor market because women have few opportunities to work outside the home. One important determinant of a woman’s fallback position outside of marriage, however, is the support she could expect to receive from her natal family. Important indicators here are the assets she brought to marriage and the dowry her family paid at the time of her wedding.

Huband and Wife Assets

The mean value of a wife’s current assets is only a tiny fraction of total household wealth. Land is the most unequally distributed asset. Animals

and durables (jewelry, household items, agricultural and business equipment) are less unequally distributed, although the differences are still substantial.

Husband premarital assets also swamp those of wives in every category, especially land and livestock. Women own some durables and land before marriage. It appears that over the course of marriage, men accumulate larger amounts of land, through inheritance, purchases, or both. Husband livestock values decline after marriage. Wives, on the other hand, accumulate livestock, mostly in the form of small animals. Brides, on average, received larger wedding transfers than did grooms.

Preschooler Illness

Short-term morbidity for individual household members was reported by the head female, who was asked whether any member had experienced an illness in the 14 days preceding the survey, and if so, the symptoms and duration. Fifty-seven percent of preschool children in this study were reported as having an illness during this period. The majority of problems suffered by preschoolers consisted of respiratory symptoms, with a prevalence of 30 percent; fever, with a prevalence of 23 percent; and diarrhea, with a prevalence of 13 percent. These illnesses are major contributors to infant and child mortality in Bangladesh.

Boys had higher morbidity prevalence than girls. Sixty-one percent of boys, but only 53 percent of girls, had an illness in the two weeks preceding the survey, a statistically significant difference.

To assess the magnitude of morbidity among preschoolers, the number of days a child is ill is the outcome examined in the analysis. All preschoolers are included in the analysis—that is, nonsick children are counted as having zero days. Since illness days are reported for all children, regardless of their experiencing an illness episode, the dependent variable is called “unconditional illness days.” This measure is useful because it combines prevalence and duration of illness. Mean unconditional illness days for preschoolers was 3.9 overall, 4.1 for boys, and 3.6 for girls.

With greater per capita assets in the household, overall morbidity, diarrhea, and respiratory morbidity decrease slightly for children as a group, especially when moving from the poorest to the middle-income group. Overall and respiratory sickness do not always fall monotonically with income, however.

Findings

To test the bargaining hypothesis, the study examined the impact of household resource ownership patterns on girl and boy morbidity. Resource control is measured along several dimensions: (1) maternal share of current assets, (2) maternal share of premarital assets, and (3) maternal share of marriage payments.²

The resource ownership profile within the household has differential effects on the health of male versus female preschoolers: mothers' resources are generally more beneficial for girls, whereas fathers' are more beneficial for boys (Table 17.1). Controlling for current household assets per capita, a higher share of current assets held by the father reduces boy illness days. Shares of current household assets do not appear, however, to have a significant impact on girl child morbidity. In contrast to the effect of father's assets, a higher proportion of pre-wedding assets held by the mother decreases the morbidity of girl children.

For payments made at the time of marriage, a greater share directed toward the husband reduces child morbidity, regardless of sex. This finding may at first appear contrary to expectation, given the evidence from other parts of the world that maternal resource control improves child welfare. When taken in the cultural context of rural Bangladesh, however, the impacts of marriage payments later in the relationship are not surprising. These results are consistent with the findings from other studies of South Asia that examine the intrahousehold consequences of marriage payments and find, for example, that lower dowry (transfers from the wife's to the husband's side at the time of marriage) increases wife-beating and reduces child caloric intake during the marriage (Rao and Bloch 1993).

²To test the model and estimate the demand for child health, a morbidity function is estimated. Explanatory variables include child-specific characteristics including age, age squared, sex, height-for-age Z-score (HAZ), and birth order; maternal characteristics such as age, age squared, dummies for primary and secondary school completion, height, and indicators of her knowledge regarding the public health system and nutritional content of foods; paternal attributes consisting of the father's age, age squared, dummies for primary, secondary, and university completion, and height; household-level characteristics including a household sanitation score, the log of household size, the number of persons in different age-sex demographic groups in the household, the log of monthly household expenditure per capita, the log value of current household assets per capita, individual parental asset shares, the log value of total wedding transfers made at the time of the couple's wedding, and the share of wedding transfers received by each spouse. Dummy variables indicating household location, survey round, and their interactions are also included to capture differences in sites, seasons, and variations in seasonality patterns across the three sites.

Table 17.1 Impact of parental asset and wedding payment shares on preschool girl and boy illness days

Version	Girls		Boys		Difference(G - B)	
	Coefficient	Z-score	Coefficient	Z-score	Coefficient	Z-score
Version 1A						
Mother's share of current assets	-2.404	-1.08	4.366	1.90	-6.770	-2.12
Ln per capita current household assets	-0.378	-1.81	0.220	0.85	-0.599	-1.80
Ln average per capita expense per month	0.037	0.05	-0.311	-0.42	0.348	0.32
Version 1B						
Father's share of current assets	-0.775	-0.69	-2.054	-1.94	1.279	0.83
Ln per capita current household assets	-0.162	-0.83	0.216	0.85	-0.378	-1.18
Ln average per capita expense per month	-0.091	-0.12	-0.272	-0.36	0.180	0.17
Version 2						
Mother's share of prewedding assets	-2.317	-2.08	-0.454	-0.39	-1.863	-1.16
Ln total prewedding assets	-0.385	-2.26	-0.215	-1.09	-0.169	-0.65
Ln per capita current household assets	-0.225	-1.09	0.219	0.74	-0.444	-1.23
Ln average per capita expense per month	0.586	0.74	0.217	0.27	0.369	0.33
Version 3						
Father's share of wedding transfers	-1.874	-2.11	-1.722	-1.77	-0.152	-0.12
Ln total wedding transfers	-0.151	-0.50	0.200	0.70	-0.352	-0.85
Ln per capita current household assets	-0.254	-1.36	-0.095	-0.35	-0.159	-0.48
Ln average per capita expense per month	0.176	0.22	-0.089	-0.11	0.264	0.24

Notes: Regressions include the other variables indicated in footnote 2. Monetary values are expressed in natural logarithms (Ln) of Bangladeshi taka. Z-values in bold indicate statistical significance at 10 percent or better.

The extended family also plays an important role in the production of child health. The mother's number of living brothers reduces illness days for both boys and girls; this finding is consistent with cultural practices of female transference of entitled inheritance to brothers in exchange for future brotherly support.

The study has several policy implications. First, increasing maternal control over resources within marriage should improve the health of children, especially girls. Second, a higher degree of female command over household wealth may encourage parents in subsequent generations to invest more in daughters. Third, establishment of a formal social security system could reduce bias toward investment in sons by decreasing elderly parents' reliance on adult sons.

Household Structure and Child Well-Being: Evidence from KwaZulu-Natal

John A. Maluccio, Duncan Thomas, and Lawrence Haddad

Before 1994 the policy of apartheid in South Africa had systematically denied the majority of the population access to resources through legal restrictions on mobility, property rights, and residential location (Thompson 1990). South African industry fulfilled labor requirements in key industries largely using migrant laborers—mostly men—who worked in one place while their families resided elsewhere. As a result, many South African families have been characterized as “double-rooted,” with one root in the poorer, more rural areas designated for blacks relying on income from the other root in the higher-income, urban, industrial, and mining areas. In 1993 one in four of all black South African households were dependent on remittance income (Carter and May 1999). Moreover, it is estimated that more than 50 percent of all black children age six and under were not living with their father, and 15 percent of these children were also not living with their mother.

What effects did the dramatic changes in South Africa have on families and households in the five years that followed? We find that there was a dramatic rise in migration in the 1993-98 period compared with the previous five years. This migration has had a large impact on household structure, especially the coresidence decisions of prime age adults. As a result, more young children are being raised in the absence of one or both of their parents. We examine the potential implications of these changes in household

This chapter summarizes preliminary analysis from Maluccio and Thomas (2001).

structure for the welfare of household members and for the human capital of young children in particular.

Family Structure and Child Well-Being

Very few studies examine the causal impact of family structure on child outcomes in Africa.¹ The distinction between family and household is especially germane as many families are split across households, and in some instances multiple nuclear families coreside in a single household. The combination of this complexity of family structure and the changes that have taken place since 1994, as South Africa has taken its first steps toward democracy, provides a laboratory to examine the links between family structure and child outcomes. During apartheid, government policy sought to split households, with migrant labor working in the urban and industrial areas and family members remaining in the so-called homelands. With the dismantling of apartheid, the restrictions on geographic mobility, ownership of assets including land, and residential choice were all lifted. Simultaneously, the new government sought to redress the imbalance in investments and allocation of public resources to reduce poverty and inequality while also promoting new investments from within and from outside South Africa.

The impact of these changes on household composition is ambiguous. On the one hand, reductions in restrictions on mobility, ownership, and residential choice should increase the probability a family will coreside, since those who would have preferred to coreside but were barred from doing so could now form a single household. Higher costs of living in urban areas, however, and increased investments in areas that were already well endowed in infrastructure and jobs may increase the incidence of family members' not being coresident. Even the impact of economic shocks on mobility will depend on whether these shocks are perceived as permanent or temporary. The specific response of families to these changes will also depend on their demographic characteristics. Thus, the magnitude, and even the direction, of changes in family structure are, fundamentally, empirical questions.

Theory does not provide an unambiguous prediction about the effect of family composition on family welfare. For children, residential instability, with less than continuous parenting by mothers and fathers, could have a

¹For recent discussions, see Adepoju (1997) and Jacoby (1995).

negative impact on child welfare if parental child care substitutes are less than perfect substitutes and if the income-earning capacities of the child's different residences are unpredictable. On the other hand, the complex household structures that have evolved in response to apartheid may represent an effective coping strategy for household members. Adversity may lead to the strengthening of networks of reciprocity and trust, within households, families, and communities, which may have positive welfare effects. For example, the fostering of children may actually promote child welfare, depending on the parenting abilities and resources of natural and foster parents (Zimmerman 1999). It is important to assess whether these forces exist and, if they do, to assess whether postapartheid policies will undermine such forms of self-reliance, without giving members of new household structures the assistance required to provide for the welfare of their children.

Data

The research (Maluccio and Thomas 2001) draws on a panel data set of 1,200 households interviewed in 1993 and then again in 1998 in KwaZulu-Natal, South Africa's largest province, which contains one-fifth of a population of 40 million. To ensure comparability, the 1998 household questionnaire largely followed the 1993 version, though there were some important changes. One of these was a greater focus on the individual, especially in terms of ownership of assets and control over their use. A second underlying change was an expanded emphasis on the set of individuals not living in the household but economically linked to it. Finally, four new sections were added, including economic shocks (both positive and negative), social capital (including group membership, kin networks, civic engagement), assets brought to marriage, and household decisionmaking. To the extent possible, the new sections on economic shocks and social capital were replicated in community-level surveys. The final aspect of the 1998 survey that is critical to this research is that when possible, we tracked, followed, and reinterviewed households who had moved.

Empirical Results

Household structure can be quite complex, making description difficult. This is particularly true in South Africa, where a variety of structures has evolved, in part because of labor and migratory policies. Thus, an important component of the survey design was the definition of the household. To

account for the complexity of the South African situation, a two-tiered definition for household members, resident or nonresident, was formulated, based on time spent in residence.² Only limited information was collected from nonresident household members.

Between 1993 and 1998 household size increased, though by how much depends on the definition of household membership used. The more restrictive "resident member" definition (more than 15 days in the past month) suggests only a small increase of 0.11 members on average, whereas the "resident" and "nonresident" definition (more than 15 days in the past year) indicates a larger increase of 0.41 members on average. Taken together, they suggest that at the same time that household size is increasing, the stability of the household in terms of permanence of residence is declining. Furthermore, this instability is focused among adults; for children under 15 years, there is only a minute proportion reporting nonresident member status.

There is a good deal of mobility across households in South Africa, particularly among children and young adults. Among children, there are as many new entrants as there are exiters from households, but this is not true for young adults. More women in their twenties and men age 16 through 40 leave the household than join it. Since these are prime reproductive years for women, and since there is no net loss in children in the household, this suggests that parents are leaving their children in the origin household as they strike out either on their own or together.

Indeed, in 1993 only 10 percent of children under age 4 were not living with their mother; by 1998 this fraction had almost doubled. While the probability that an older child lived with the mother was lower in 1998 relative to 1993, the changes are not as dramatic. Relative to mothers, fathers in South Africa are far less likely to be living with their children. In 1993, for example, only half the children age under 4 were living with their father. By 1998 that fraction had fallen to a third. As children age, they are less likely to be living with their mother and more likely to be living with their

²PSLSD (1994) provides the details: "resident household members were defined as (1) those who had lived under this roof for more than 15 of the last 30 days; (2) when they are together they share food from a common source (that is, they cook and eat together); and (3) contributing to or sharing in a common resource pool (that is, they contribute to the household through wages and salaries or other cash and in-kind income or they may be benefiting from this income but not contributing to it, for example, children, and other non-economically active people in the household" (p. iv). The household was also defined to include nonresident members, that is, those that satisfied conditions 2 and 3 but who needed only to have lived under the same roof at least 15 days out of the past year.

father. Nonetheless, in 1998 fewer than half the children under 16 were living with their father.

These very basic facts suggest that household and family living arrangements in South Africa are both very complex and undergoing considerable transformation. With the loosening restrictions on mobility and residence, one might expect families to recombine. The evidence suggests that recombination may have been limited to spouses living together, but children were often left in the origin location. By 1998 more than 10 percent of children under 7 were not living with either parent, and that fraction is twice as high for children age 7 to 15.

Changes in Child Outcomes between 1993 and 1998

How did children fare during this period? The effects of public investments in schools and the removal of color bars are readily apparent in the dramatic increases in school enrollment among 7- to 12-year-olds (Table 18.1). By

Table 18.1 Changes in child welfare outcomes, 1993–98

	1993	1998	1998 minus 1993 <i>t</i> -test
7- to 12-year-old school enrollment rate	87.9%	97.2% (0.01)	9.3**
12- to 16-year-old-school enrollment rate	91.8%	96.2% (0.01)	4.4**
0- to 3-year-olds			
Mean height-for-age Z-score	-1.2 (1.7)	-0.7 (1.8)	0.5** (0.1)
Mean weight-for-height Z-score	0.0 (1.4)	0.4 (1.2)	0.3** (0.1)
4- to 6-year-olds			
Mean height-for-age Z-score	-1.1 (1.5)	-0.9 (1.6)	0.2* (0.1)
Mean weight-for-height Z-score	0.1 (1.4)	0.3 (1.1)	0.2* (0.1)

Notes: Figures in parentheses are standard deviations in the first two columns and standard error from two-sample *t*-test (with unequal variances) comparison of the 1993 and 1998 means.

**indicates significant difference at 1 percent level; * indicates significant difference at 5 percent level.

1998 primary school-age children were almost universally enrolled in school, and during the five years between the surveys, enrollments rose by more than 10 percent for this age group. At the same time, secondary school enrollments rose by about 5 percent, and fewer than 5 percent of children age 12 to 16 were not in school in 1998. These are impressive gains and provide an estimate of the secular improvement in human capital of young South Africans.

Height-for-age, a measure of longer-run nutritional status, has also improved. In 1993 the average South African under 3 years of age was 1.2 standard deviations shorter than a United States child of the same age and gender (second panel of Table 18.1). By 1998 over a third of that deficit had been erased. Children born after 1995 are significantly and substantially

Table 18.2 Difference in mean height-for-age Z-scores between children under 4 who are living with their parents and those who are not, over time

	1993	1998	1993–98 DD
0- to 3-year-olds (all children)			
Mother coresident	-1.2	-0.8	
Mother non-coresident	-1.6	-0.4	
Difference	0.5**	-0.4**	-0.9**
Sample size (number of children)	585	503	
0- to 3-year-olds ("siblings" includes household fixed effects)			
Difference	0.6	-0.5	-2.0**
Number of households	434	372	645
0- to 3-year-olds (all children)			
Father coresident	-1.0	-0.6	
Father non-coresident	-1.3	-0.8	
Difference	0.3*	0.2	-0.0
Sample size (number of children)	575	480	
0- to 3-year-olds ("siblings" includes household fixed effects)			
Difference	-0.2	0.3	0.0
Number of households	434	372	645

Note: DD = difference in difference: difference in outcomes between children living with the parent and those not, over time. ** indicates significant difference at 1 percent level;

* indicates significant difference at 5 percent level.

better nourished relative to those born prior to the removal of apartheid. Weight-for-height, a shorter-run indicator of nutritional status, also increased significantly during the 1990s, and South African children are, on average, heavier, given height, than their American counterparts. For 4- to 6-year-olds (third panel of Table 18.2), gains in nutritional status did not emerge only in the late 1990s but stretch back prior to the first democratic elections and at least back to 1992, when they were between 0 and 3 years of age. The gains for this older group, however, are much smaller than those realized among 0- to 3-year-olds.

Household Structure and Child Anthropometry

What impact did household structure have on the well-being of various individuals in the household? In 1993 children living with their mothers were significantly taller than children not coresident with their mothers (Table 18.2). By 1998 this advantage had reversed. In both 1993 and 1998 those children coresiding with their father were taller (although the

Table 18.3 Difference in outcomes between children living with their parents and those who are not, over time (1998 and 1993)

	DD mother	DDD FE mother child age	DD FE mother urban	DD FE father
0- to 3-year-olds ("siblings" only)				
Mean height-for-age Z-score	-2.0**	—	-2.2*	0.1
4-to 6-year-olds ("siblings" only)				
Mean height-for-age Z-score	-0.2	—	-0.6	-0.8*
Mean weight-for-height Z-score	-0.4	—	-1.1	-0.8*
DDD mean height-for-age Z score: difference between 0- to 3-year- olds and 4- to 7-year-olds		-1.2**		
DDD mean weight-for-height Z score: difference between 0- to 3-year-olds and 4- to 7- year-olds		0.4		

Notes: DD = difference in difference: difference in outcomes between children living with the parent and those not, over time; FE = fixed effects estimates control for differences within families; DDD = difference-in-difference-in-difference, using older children in the same households as controls for younger children. ** indicates significant difference at 1 percent level; * indicates significant difference at 5 percent level.

significance is marginal in 1998). Controlling for residence within the same household, however, the difference in outcomes between the two time periods is zero.³ We conclude that in South Africa, presence of fathers, unlike presence of mothers, does not matter.

Is it possible that migration of mothers is driven by unobserved factors that also lead them to invest more in children? Drawing from the nutrition literature, we note that an individual's attained height as an adult is essentially determined by around age 3. After that age, height is not affected by variation in environmental characteristics except in the case of extreme nutritional distress such as might occur during a famine (Martorell and Habicht 1986). Household structure should, therefore, influence the height of children under age 4 and have no impact on those older than 4. Therefore, we use children age 4–6 in the same household as “controls” for children age 0–3. Consistent with our interpretation that the maternal coresidence effects are causal, there is no evidence that the height of children age 4–6 is affected by the presence of the mother in the household (Table 18.3). If those mothers who left the household between 1993 and 1998 were inclined to invest more in their children, their older children would be taller than peers whose mothers did not migrate. There are no effects on weight-for-height.

We also compare the results between urban and rural households, the group that is more likely to be affected by the repeal of the pass laws. The estimated effect of maternal coresidence is, again, significant, and there is no difference among 4- to 6-year-olds, further supporting our interpretation that the effect we have uncovered for maternal presence in the household is causal. Among 4- to 6-year-olds, however, we see that children whose fathers are present in the household are significantly shorter and lighter, given height, than their peers who do not reside with their father. We infer that this is capturing a selection effect—more resourceful fathers that invest more in their children tend to live away from them.

Finally, we examine the effect of mother's presence on the young children under age 4 using their older siblings as controls. Consistent with the findings described thus far, mothers' absences continue to have a strong effect on height-for-age Z-scores, although the magnitude (about 1 standard deviation) is only half that previously estimated.

³Fixed-effects estimates control for residence within the same household by adding a dummy variable for each household.

Conclusions

The new South Africa has undergone many changes in recent years. As the strictures surrounding the apartheid state are dismantled, there has been an increase in geographic mobility, particularly among prime age adults. This increased mobility has resulted in an increase in the percentage of young children being raised without their parents present. In contrast with the evidence in the developed world, those children who are not coresident with their mothers are no worse off than their peers who live with their mothers. In fact, they are better off. In addition, the findings do not appear to be merely the result of selectively good mothers leaving their children behind since, if this were the case, similar findings would have held for the older 4- to 7-year-old age groups—but they do not.

Is this counterintuitive? It could be that the mothers who are moving are those that are grasping the new opportunities and making the most of them. A possible underlying mechanism is that income earned by these mothers is perhaps remitted and underpins their children's success. The finding is important since it suggests that growing up in a home without the presence of one's mother in the new South Africa not only is becoming increasingly common, but also is associated with better longer-term outcomes for the next generation of South Africans. Apparently, the family in South Africa is able to substitute very well for the mother. Policies that artificially promote family unification are likely to be counterproductive.

Adult Health in the Time of Drought

John Hoddinott and Bill Kinsey

It is a well-known fact that households in developing countries often undergo weather-related and other shocks that drastically affect incomes. A large and growing literature explores the effectiveness of response to these events. One strand of the literature addresses the strategies that households and governments use to protect against income shocks (Udry 1990; Fafchamps, Udry, and Czukas 1998; Kochar 1999). A second strand looks at the effectiveness of these strategies in reducing fluctuations in consumption. The principal result, summarized in Morduch (1995, 1999a) and Townsend (1995), is that some, but not all, households are able to smooth consumption. Households facing liquidity constraints, in particular, have limited smoothing ability. For these households, income fluctuations lead to a welfare loss.

This study examines the impact of drought on the individual. The handful of studies that have dealt with this subject has all focused on children (Foster 1995; Jacoby and Skoufias 1997; Rose 1999; Hoddinott and Kinsey 2001). By contrast, this study looks at adults and changes in their body mass. It measures body mass for three reasons. First, body mass index (BMI) is a good proxy for underlying adult health, which is a valid indicator of shock effects in its own right (North 1999). Second, evidence increasingly links adult BMI to agricultural productivity, and therefore to longer-term

For details, see Hoddinott and Kinsey (2000).

economic welfare (Pitt, Rosenzweig, and Hassan 1990; Dasgupta 1993; Strauss and Thomas 1995; Dercon and Krishnan 2000). Third, low BMI correlates with a large number of health-related indicators, including early onset of chronic conditions and increased risk of premature mortality (Waalder 1984 cited in Higgins and Alderman 1997; North 1999).

This study examines the impact of income shocks by assessing the effects of the 1994/95 drought on adult health in Zimbabwe.

The Study Sample

The study draws on a unique panel data set of households residing in rural Zimbabwe. It analyzes information for 1994–97 from annual surveys of about 400 households in three agroclimatic regions. These surveys contain adult anthropometric data, together with other relevant individual, household, and community information. In the survey period, two years of reasonably good rainfall were followed by one drought year and one year of especially good rainfall and crop production.

The Effect of Drought on Adult Health

Table 19.1 presents regressions on BMI estimated separately for men and women. These regressions define rainfall shocks using a dummy variable that equals one if the individual was measured in 1996 (the aftermath of the 1994/95 drought), zero otherwise. The negative coefficient on this variable for women, but not for men, shows that the drought is associated with a reduction in the body mass of women but not men. This variable is not an entirely satisfactory way of measuring the impact of rainfall shocks, however, because it does not differentiate the intensity of the shock experienced across the three regions and treats all nondrought years alike, despite significant variations in rainfall across these years. Consequently, a second measure is also reported. This is the impact of positive and negative shocks, or deviations, from long-term averages, an approach first used by Fafchamps, Udry, and Czukas (1998). The core result in these regressions is that, controlling for household and locality characteristics and individual fixed effects, the drought reduced women's BMI by 1.15 percent for every 10 percent negative deviation in rainfall from the long-term average. Male BMIs were unaffected by changes in rainfall. Other results show that changes in agricultural capital stock during the drought year did not affect adult body mass. But livestock held in the year before the drought had a positive impact

Table 19.1 Determinants of log body mass index, individual-level fixed-effects estimates

	Women		Men	
	With post-drought year dummy	With positive and negative shocks	With post-drought year dummy	With positive and negative shocks
Rainfall shocks				
Post-drought year dummy (year of observation is 1996)	-0.028**	—	-0.005	—
Positive rainfall shock	—	-0.006	—	-0.082
Negative rainfall shock	—	-0.115**	—	-0.094
Time-varying household characteristics				
Log of lagged agricultural stock	0.004	0.006	0.001	0.004
Log of lagged value of livestock	0.004*	0.004*	-0.001	-0.001
Time-varying locality characteristics				
Agricultural wage rate	0.003	0.002	0.002	-0.0001
Price of beef	-0.010	-0.009	-0.002	0.013
Price of cooking oil	-0.027**	-0.025	-0.017	0.007
Clinic experiences drug shortages	-0.062**	-0.054	-0.070**	-0.021
Clinic experiences staff shortages	-0.013	-0.007	-0.015	0.034
F-statistic on regressors	4.12**	3.70**	0.87	0.94
F-statistic on individual fixed effects	8.66**	8.64**	5.41**	5.43**

Notes: DD = difference in difference: difference in outcomes between children living with the parent and those not, over time; FE = fixed effects estimates control for differences within families; DDD = difference-in-difference-in-difference, using older children in the same households as controls for younger children. ** indicates significant difference at 1 percent level; * indicates significant difference at 5 percent level.

on the BMI of women who experienced the drought (this relationship did not hold for men). Drug shortages in local clinics were associated with reductions in adult body mass (this result was more robust for women than for men). And staff shortages in these clinics did not appear to worsen adult health.

The impact of livestock holdings on women's body mass deserves further comment. In the very different environment of semi-arid West Africa, livestock transactions do not appear to play a major role in smoothing household consumption. But in rural Zimbabwe, livestock holdings improve women's health through two possible channels. First, livestock are a relatively liquid store of wealth whose real value has been maintained in Zimbabwe despite persistent inflation. Second, livestock—especially oxen—can substitute for a wide variety of labor tasks. In addition to ox-plowing instead

of manual hoeing, oxen can be used to pull carts carrying firewood and water. These activities are regarded as women's responsibilities in the survey area. Not only does animal haulage reduce human energy expenditures, but it also allows greater quantities of wood and water to be collected during a single trip.

Results further show that the impact of negative rainfall shock does not fall uniformly on all women (Table 19.2). Drought did not affect the BMIs of daughters-in-law of the household head. But wives and daughters were adversely affected, with a 10 percent reduction in rainfall corresponding to a 2.2 and 3.9 percent reduction in BMIs, respectively. If a household held livestock, however, wives of the household head retained BMIs. These findings suggest that wives are vulnerable to drought to the extent that households lack assets that they can use as buffers against income shocks.

By contrast, household assets apparently do not help daughters of household heads maintain their BMIs. The authors hypothesize that during drought, these women have relatively unchanged energy needs. They may continue to have responsibilities for household activities such as collection of water and fuel. If daughters have a harder time finding these resources during drought or are forced to seek employment outside the household, their energy expenditures might actually increase. At the same time, the position of daughters in the household can be somewhat ambiguous. Women who have returned to the household following failed marriages are sometimes stigmatized. Their relatives may expect them to return to their husbands. In such circumstances, household heads may limit the amount of

Table 19.2 Determinants of log body mass index, by relationship to household head, individual fixed-effects regressions

	Relationship to household head				
	Wife	Daughter	Daughter-in-law	Head	Son
Positive rainfall shock	-0.102	-0.222	0.105	-0.060	-0.136
Negative rainfall shock	-0.217**	-0.386**	0.023	-0.066	-0.203
Log of lagged value of livestock	0.006**	-0.002	0.001	-0.001	-0.001
Number of individuals	192	42	115	149	65

Notes: Dependent variable is log of body mass index. Sample consists of adults (household heads and wives, daughters, daughters-in-law and sons of head) with a child aged 6 to 72 months currently residing in the household. Other regressors included but not reported are log of lagged agricultural capital stock, wage rate, price of beef and cooking oil, and clinics experiencing drug or staff shortages.

* indicates significant at the 10 percent level; ** indicates significant at the 5 percent level.

resources made available to daughters. Unmarried daughters who have had children out of wedlock may face similar constraints within their households.

The BMIs of daughters-in-law remain unchanged by drought perhaps because these women have access to resources outside the household. Regulations in the survey area severely limit off-farm work for household heads but not for their children. Consequently, daughters-in-law may have access to remittance income that offsets the impact of drought.

As can be expected, the drought disproportionately affects poorer households. This finding is consistent with the argument that livestock holdings built up prior to drought provide a means of smoothing consumption.

These results have focused on ex ante strategies for reducing the effects of drought. What can be said about ex post strategies such as the grain loans offered to drought-stricken households? Findings suggest that the grain loans scheme implemented by the government had no significant impact on adult body mass. These results, however, should be regarded with some caution because of measurement difficulties.

Conclusions

Although women, but not men, were adversely affected by the 1994/95 drought, they did not bear the effects equally. Women in poor households and daughters generally bore the brunt of the shock. An ex ante private coping strategy, the accumulation of livestock, protected women who could afford it against the adverse consequences of drought. By contrast, ex post public responses were not effective, though this finding should be treated with caution.

PART 4

**Social Capital,
Legal Institutions,
and Property Rights**

Social Capital, Legal Institutions, and Property Rights: Overview

Agnes R. Quisumbing

The previous sections have highlighted the importance of assets as a determinant of bargaining power within marriage. Both formal and informal institutions underlie asset accumulation and provide the basis for property rights. When women face social and legal restrictions in acquiring certain forms of assets, such as land, they may resort to accumulating other “assets” and investing in other forms of capital. One of these forms of capital is social capital, which includes any networks that increase trust, ability to work together, access to opportunities, and reciprocity; informal safety nets; and membership in organizations (Chambers and Conway 1992; Scoones 1998; Devereux 2001; Adato and Meinzen-Dick 2002). For example, working through groups is one major mechanism through which outside programs and women themselves can improve their status (Quisumbing and Meinzen-Dick 2001; Dikito-Wachtmeister 2001). In fact, the networks and collective action that groups generate are now being recognized as an asset in itself. Social capital may be one asset in which women are less disadvantaged or even hold an advantage. Microfinance is perhaps the best-known type of program that works through women’s groups. Group savings, credit, and insurance programs for women substitute collective action through the groups for conventional assets (such as land) as collateral (Sharma 2001).

Women may also resort to formal and informal networks to cope with shocks and to make sure that their views are represented, particularly if formal rules limit their participation. Family and friendship networks have historically provided some measure of social security (see, for example, the description of the “economy of affection” in Hyden 1987), but they have often been inadequate for the very poor, and pressures of migration and

broader change are breaking down the institutions that provided such security (Adato and Feldman 2001). Women who are not members of formal organizations may use informal ways of making sure that their needs are met—as is the case of women nonmembers of water users' associations in South Asia, who channel their views through their husbands or male relatives, as well as receive information from them (Meinzen-Dick and Zwarteveen, Chapter 22).

The contrast between formal, legal rights and informal, customary rights is probably most important in defining women's fallback options in the case of divorce or death. Although legal reforms have been implemented in many countries, what often determines fallback options in reality is customary law, or local interpretations of statutory law. For example, the 1960 Civil Code in Ethiopia gave women more rights than their contemporaries in the United States or the United Kingdom (Gopal 2001). The civil code, however, maintained the age-old tradition of dispute settlement by personal arbitrators, normally older men within the family or community selected by the disputants. The arbitrators, unfamiliar with or unsympathetic to the new laws, continued to apply old customary laws. The *de jure* system had nothing to do with the *de facto* reality that existed for the next 30 years. Similarly, in Ghana the practice of giving "gifts" to one's wife or children to circumvent inheritance by matrilineal relatives predates the passage of the Intestate Succession Law in 1985, which provided for a man's wife and children should he die intestate (see Quisumbing et al., Chapter 24).

The chapters in this section explore the role of informal social and legal institutions in determining household and individual well-being. For example, if social capital is indeed an asset, what are the returns to investing in social capital? Do men and women invest differently in this asset? If participating in groups is key to increasing women's control of resources, what are concrete ways to increase women's participation in groups as well as the benefits they derive from participation? The study by Maluccio, Haddad, and May (Chapter 21) attempts to answer this question by testing whether men and women in South Africa have social capital to the same degree and whether returns to men's and women's social capital, proxied by membership in formal and informal groups, differ. The chapter by Meinzen-Dick and Zwarteveen (Chapter 22) examines women's participation in water users' associations in South Asia and discusses ways to increase women's involvement in resource management organizations. The chapters by Fafchamps and Quisumbing (Chapter 23) and Quisumbing et al. (Chapter 24) explore different aspects of informal legal institutions in Ethiopia and Ghana, respectively. The Ethiopia chapter examines the determinants of the

distribution of assets upon death or divorce, often viewed as a determinant of the fallback option of spouses, and hence, of their bargaining power within marriage. The Ghana chapter reports on the strengthening of women's land rights through the process of gift giving during one's lifetime, rather than through inheritance or bequests, in response to an increased demand for women's labor in cocoa production.

Contribution of Each Chapter

The Maluccio, Haddad, and May chapter (Chapter 21) illustrates how qualitative techniques can inform the design and interpretation of research on social capital in South Africa. Before fielding a quantitative survey—a resurvey of households in KwaZulu-Natal—a qualitative study using six community focus groups and 30 short household case studies was conducted in three rural communities. The qualitative study identified the different types and roles of networks to which men and women belonged. Women tended to have wider networks but mobilized fewer resources than men. Questions on group membership, family and nonfamily networks, civic engagement, trust, and violence were then fielded in the quantitative survey. Quantitative analyses of the effect of social capital accumulated by men and women—proxied by their membership in formal and informal groups—on household consumption expenditure shows that returns to men's and women's social capital were insignificant before the dismantling of apartheid but positive and significant afterward.

The study by Meinzen-Dick and Zwartveen (Chapter 22) draws on a review of water users' associations in India, Nepal, Pakistan, and Sri Lanka. Their review finds that women's participation in these organizations is lower than men's, despite the high involvement of women in irrigated agriculture and agricultural decisionmaking. The study identifies two factors behind low participation of women: rules for membership, which determine eligibility to participate, and benefits to be derived from involvement, which influence women's decisions to participate. Interestingly, even if women are not formal members of associations to the same degree as men, they are able to get their needs met by channeling their views through informal domains—through their husbands or male relatives. Female networks may also be important, especially where male and female networks are highly segregated. Despite women's apparent success in using informal mechanisms to express their needs, the authors argue that such informal mechanisms may increase women's dependence on others, while independent rights to resources can

increase women's standing and bargaining power. The authors then explore concrete ways through which women's participation in resource management organizations can be increased and made more effective.

The Fafchamps and Quisumbing chapter (Chapter 23) provides a detailed picture of the determinants of the control and ownership of assets in rural Ethiopia. In most studies of intrahousehold allocation in poor rural areas of developing countries, economists have often had to rely on anthropological accounts of patrimonial customs, vague generalities about marriage and divorce practices, or legal principles that only affect relationships between (not within) households. Drawing on a series of village studies in Ethiopia, this study is one of the first attempts to address issues of local norms regarding the disposition of assets and determinants of asset control using a large household survey. The study finds that the single best predictor of expected disposition of assets is the average disposition rule in the village. After controlling for local norms, assets brought to marriage are important determinants of the distribution upon divorce but have little impact on disposition upon death. Control over productive resources tends to be centralized into the hands of the household head and is associated with larger claims over these assets upon divorce. Although women tend to command fewer land resources than men, local policy, as practiced by Peasant Associations in awarding "land to the tiller," has granted women rights to land in actual practice. The chapter concludes by suggesting that women's individual rights be considered in combination with informal entitlements that protect women in more roundabout, though often more paternalistic, ways.

The chapter by Quisumbing et al. (Chapter 24) examines the determinants of land acquisition in Western Ghana and the effect of individualization of land rights on the probability of cocoa planting and on cocoa yields. This study reinforces the importance of local practice and community norms in determining women's property rights to land. Whereas women traditionally do not inherit land from their husbands, since property reverts to the matriline, the rise of inter vivos gift transfers have helped women acquire strong individual property rights. Because of high demand for women's labor in cocoa cultivation, husbands have been giving their wives strong individualized rights to cocoa land after wives have helped husbands establish cocoa farms. This practice even predates formal legal reform to strengthen women's land rights. But guaranteeing women's rights to land is not enough. Although both male and female parcel managers are equally likely to plant cocoa, women farmers have slightly lower yields. This finding suggests that attempts to equalize land rights of men and women will

improve the productivity of women farmers only if other constraints faced by women are also addressed.

Key Messages

1. Men and women accumulate different forms of social capital, and to different degrees. Women tend to have wider networks than men but mobilize fewer resources. While the returns to men's and women's social capital may be identical, the responsiveness of household welfare (as proxied by per capita expenditure) to women's social capital is higher, owing to the higher level of women's participation. The opening of new economic, political, and social opportunities may also increase the returns to investing in social capital for both men and women, owing to the economic, political, and social changes effected by the transition to democratic governance.
2. Where formal membership in groups is limited, women often resort to informal mechanisms to meet their needs. Women's gaining access to resources using indirect means, however, may not provide direct control over the resource. In the case of water users' groups, some of the uses of water by women, such as water for irrigating homestead gardens or watering livestock, are likely not to be included in formal water distribution plans. Such informal mechanisms to obtain access may increase their dependence on others, while obtaining membership in their own right may increase their bargaining power.
3. Increasing returns to women's participation in groups may involve changing the criteria for group membership as well as groups' operational procedures. For example, instead of allowing one member per household, groups could allow both male and female members of households to be eligible for membership. Attention also needs to be paid to details such as the timing, location, and structure of formal meetings, which should reflect the importance of women's participation and allow their opinions to be taken seriously. Women may also need to be trained to participate more effectively in groups, knowing full well that increasing their experience in groups will enable them to be more visible and to participate more in other decisionmaking arenas.
4. Although legal reform and reform of the marriage code may have changed women's legal rights, customary law may matter more in actual practice—local norms are often the most important determinant of actual disposition rules. Within communities sharing the same norms, however,

assets that women bring to marriage are an important determinant of their control of assets during marriage and their women's share upon divorce. Laws that protect women's rights to assets (especially norms regarding their rights to own land and livestock) may thus be crucial to their bargaining power within marriage.

5. Technologies that increase the demand for women's labor may improve their bargaining power and strengthen their claim over land, particularly in labor-scarce societies. Such trends can be supported by legislation that strengthens women's land rights. Titling or other land legislation should be examined for its effect on women's land rights. Men and women should be equally qualified to acquire land titles. Women also need to be made aware of their legal rights and empowered to claim them. Attempts to increase women's incomes or agricultural productivity by equalizing land rights of men and women, however, will succeed only if other constraints faced by women, such as lack of access to inputs and extension, as well as their domestic responsibilities, are also addressed.

Social Capital and Gender in South Africa, 1993–98

John A. Maluccio, Lawrence Haddad, and Julian May

The concept of social capital, well grounded in the sociological and anthropological literatures (for example, Coleman 1988), is increasingly being analyzed and used by economists and other development policy practitioners. The entry point for many economists is Robert Putnam's research on Italian regional economic performance (Putnam 1993) and his subsequent work in the United States. For Putnam, "social capital refers to features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit" (Putnam 1995, 67). This research adds a gender dimension to the debate providing empirical evidence on the role of social capital. The goal of the research is to determine whether men and women have social capital to the same degree and whether men's and women's social capital, proxied by membership in formal and informal groups, had differential effects on household welfare in South Africa in the 1990s.¹

We hypothesize three mechanisms by which social capital affects household welfare, as measured by household income. First, it may reduce the costs of transactions by improving information flows about new

This brief summarizes preliminary analysis that extends the work in Maluccio, Haddad, and May (2000).

¹Two recent studies (Grootaert 1999; Narayan and Pritchett 1999) use survey information on household membership in groups as a proxy for social capital. Both studies find large, positive, and significant effects of this measure of social capital on household welfare.

opportunities and potential shocks, improving the diffusion of innovations, and improving knowledge about the comparative performance of local government agents. Second, it may promote consultative decisionmaking as well as collective action that minimizes negative externalities and encourages the production of public goods. Third, it may foster time-sensitive exchanges for mutual benefit by developing norms of civic behavior, trust, and reputation dissemination (Coleman 1988; Fukuyama 1995; Putnam 1995). Moreover, in times of crisis, this latter mechanism may serve as informal insurance. It is very possible that these mechanisms may differ by gender.

There are a number of reasons we might expect social capital to be important for income generation in South Africa in the 1990s. First, the notion of social capital has some resonance with the traditional institution of *ubuntu*, which means, “I am because you exist” and is seen as an expression of community life and collective responsibility.² Years of apartheid, however, appear to have undermined this institution to some extent (Maluleke 1996). Second, the flagship economic policy of the first democratic government explicitly recognizes the important role to be played by local community institutions in the implementation of policy (ANC 1994). Lastly, serious crime and politically motivated violence, while still very high post-1994, have declined somewhat in recent years (Louw and Schonteich 1999). Since the 1994 national democratic elections, then, it is possible that the returns to (and therefore stocks of) social capital have risen.

Data

The research draws on a recently collected panel data set of 1,200 households interviewed in 1993 and then again in 1998 in KwaZulu-Natal, South Africa’s largest province, containing one-fifth of a population of 40 million. During the mid-1980s and again in the early 1990s, there was substantial political unrest and violence in KwaZulu-Natal. As a result, it is an especially interesting place to study social capital, which may have been partly eroded during periods of unrest. Prior to the collection of the second round of the panel, a qualitative study on social capital, gender, and economic shocks was conducted (Cross, Mngadi, and Mbhele 1998). This study included six community focus groups and 30 short household case studies in three rural communities.

²The concept of *ubuntu*, an Nguni (language group of Zulu and Xhosa) word, is recognized in many parts of Southern and East Africa.

Drawing on the results of the qualitative study, the main survey asked individuals about membership in 20 different specific groups in 1998 and retrospectively in 1993. The groups included financial, production, sports and music, community service, religious, and political organizations. Financial and religious organizations dominate, but membership in all types of groups grew substantially over the period. In addition, certain characteristics of the groups were reported, including whether they are of mixed gender and the household's rating of group performance.

Social Capital and Gender

Findings from the qualitative study suggest that there are different types of social capital and that men and women may accumulate social capital in different ways. Social networks can be classified into two types: the individual's *bound network* includes his or her kin or relatives, who are connected by strong obligations based on kinship roles, and the *achieved network* includes all the members of an individual's personal list of contacts, who are gained through experience and not through being born into a web of kinship. In addition to personal networks based on past experience, membership in institutionalized groups and community-based organizations often serves as the basis for voluntary mutual help between individuals. The two types of networks seem to fulfill different functions: bound networks help to limit downward mobility in the face of shocks, while achieved networks help with upward mobility. Bound networks may be especially important for women, who often bear the burden of crisis situations more than men, particularly for consumption crises. Women, however, have less effective economic options to fall back on than men do.

Women's social capital networks are wider than those of men but are less deep in that they mobilize fewer economic resources. Women's social contacts also tend to be among other women, while men's are among men.

The quantitative survey confirms these findings from the qualitative study. We use the following indicators of social capital: group membership, membership in family and nonfamily networks, degree of civic engagement, degree of trust, and concern about violence.

Women are more likely to be members of any group than men. In 1993 30 percent of women and 23 percent of men reported belonging to any group. In 1998 the proportion of women belonging to any group had increased to 39 percent; the proportion for men increased to 29 percent. Women tend to be concentrated in religious groups (29.4 percent, compared with 20.3 percent for men) and financial groups (14 percent versus 6.8 percent for men). Women tend to belong to same-sex groups, however,

whereas men are more likely to belong to mixed groups. Men also tend to have longer tenure in groups. Other characteristics, such as performance and meeting attendance, do not differ by gender.

Women also have wider family networks. Both adult men and women are equally likely to report that their parents would help them in an emergency. More adult women, however, report that children are likely to help, especially in rural areas. Twenty percent of rural women say that their children would help them, compared with only 12 percent of rural men. In urban areas 22 percent of women and 20 percent of men say that their children would help—not a significant difference. These potential networks correspond to the percentage of those reporting remittance receipts: 13 percent of adult women in rural areas report receiving remittances, compared with only 2 percent of men.

Despite their higher group membership, women are slightly less involved in civic affairs. Equal proportions of men and women voted in the national and local elections (95 percent). Although both men and women attend “few” community meetings, women attend fewer. Women are also less likely to read newspapers (32 percent versus 45 percent) and to listen to radio or TV news programs (83 percent versus 89 percent).

Men and women report equal levels of trust, based on a five-point scale for a number of actors. Both had high levels of trust in their extended families, neighbors, and (surprisingly) the media, medium levels of trust in local leaders and local government officials, and low levels of trust in strangers and the national government. Levels of trust increased in rural areas between 1993 and 1998 but remained flat in urban areas. In general, rural residents reported higher levels of trust.

Women and men also report equal concern for changes in violence. Although we are unable to disaggregate reports of violence by gender, in rural areas in 1998 both men and women feel safer outside the home than in 1993, but 60 percent feel less safe in urban areas. There are no gender differences in perceptions of safety outside the home.

Social Capital and Household Welfare

What kinds of individuals are more likely to accumulate social capital? Table 21.1 presents regressions on the determinants of individual social capital, estimated separately for men and women. The indicator of individual social capital is the number of groups to which an individual belongs. In both 1993 and 1998 both men and women are more likely to belong to more groups if they are the heads of their respective households. Better-educated individuals also belong to more groups. In 1998, however, household heads

Table 21.1 Determinants of individuals' group membership, 1993 and 1998

	Number of groups an individual belongs to			
	1993		1998	
	Men	Women	Men	Women
Race (1 = African; 0 = Indian)	-0.33	-0.43	0.16	0.47
Dummy = 1 if individual is the household head	0.14***	0.17***	0.26***	0.31***
Years of schooling	0.01***	0.01***	0.02***	0.01***
Age	-0.00	0.02***	-0.00	0.03***
Age squared	0.00	-0.00***	0.00***	-0.00***
Constant	0.041	0.23	0.01	-0.77
Number of observations	2,844	3,433	2,844	3,433
<i>F</i> -statistic	31.73***	88.39***	45.46***	129.18***

Notes: DD = difference in difference: difference in outcomes between children living with the parent and those not, over time; FE = fixed effects estimates control for differences within families; DDD = difference-in-difference-in-difference, using older children in the same households as controls for younger children. **indicates significant difference at 1 percent level; *indicates significant difference at 5 percent level.

belong to almost twice the number of groups they belonged to in 1993—indicating that there may be greater returns to investing in social capital in the postapartheid regime.

To explore gender effects of social capital on household welfare, we estimate, at the individual level, relationships between household-level per capita expenditures and individual characteristics, including group membership. For each individual, there are two observations, one measured in 1993 and the other in 1998, and the estimation sample is restricted to individuals 20 years of age or older who were present in both 1993 and 1998. The dependent variable is logarithmic per capita monthly expenditure (a proxy for income) less the costs of group membership. The regressors include a dummy for race, a dummy for whether the person is the head of the household, the person's years of schooling, age and age squared, a dummy for an urban location, cluster dummies, and the number of groups to which the person belongs. Standard errors allow for clustering at the household level. Why would the effect of social capital differ by gender? First, social capital may be analogous to assets at marriage and other variables that affect bargaining power and may have differential effects by gender. Second, even if women and men belong to the same groups, they may derive different benefits from membership. Lastly, men and women may belong to different groups altogether.

Table 21.2 Determinants of per capita monthly expenditure, as a function of social and human capital

	Log per capita monthly expenditure, net of costs of group membership			
	1993		1998	
	Men	Women	Men	Women
Number of groups to which individual belongs	0.02	-0.01	0.07***	0.07***
Race (1 = African; 0 = Indian)	-0.01	-0.12	0.28**	0.15
Dummy = 1 if individual is the household head	0.13***	0.01	0.12**	0.00
Years of schooling	0.03***	0.03***	0.05***	0.06***
Age	0.01	0.01***	0.01***	0.02***
Age squared	-0.00	-0.00**	-0.00*	-0.00
Urban location	1.02***	0.84***	0.35	0.47***
Constant	4.20	4.28***	3.78***	3.68***
Number of observations	1,912	2,531	1,912	2,531

Notes: Regressions include community fixed effects and robust standard errors. * indicates significant at the 10 percent level; ** indicates significant at the 5 percent level; *** indicates significant at the 1 percent level.

Our results show that in 1993 neither men's nor women's membership in groups is a significant determinant of per capita household expenditures (Table 21.2). In 1998 both women's and men's membership in groups positively affect household expenditures, and to the same degree (the point coefficients are identical). Because women's participation is greater, however, the elasticity is greater for women's social capital—that is, the percentage increase in per capita household expenditure is greater for a percentage increase in women's group membership compared with men's.³

Put a different way, those with stocks of either social or human capital in 1993 appear to have benefited from them over time. The structural and other changes in the South African economy appear to be changing the returns to various factors, possibly indicating greater levels of efficiency. While returns to social capital were less or insignificant compared with returns to schooling in 1993, they were about equal in 1998. Thus, the impact of social capital on per capita expenditures appears to be as important as that of human capital.

³In 1993 women belonged to 0.42 groups, on average, whereas men belonged to 0.27. In 1998 women belonged to 0.62 groups, and men belonged to 0.38 groups.

Summary and Conclusions

South Africa's economy is in transition, undergoing the economic, political, and social changes effected by the transition to democratic governance. The opening of new opportunities, in part due to the lifting of the various legal restrictions on labor and capital markets, property rights, and residential location that underlay the policy of apartheid, suggests that there will be structural shifts in the economy and, as a result, changes in the returns to various factors of production.

Estimating household-level logarithmic per capita expenditure functions, with a focus on the differential returns to men's and women's social capital, we find that there were substantial changes over the period. Whereas individual social capital had no apparent return for households in 1993, it does yield substantial returns in 1998. In conjunction with increased mobility, these findings are consistent with changes leading to a more efficient economy. An important concern in this analysis is the direction of causality between income and the measure of social capital based on group membership. Although joining groups may help augment one's income, it is also possible that some groups are akin to consumption goods and thus, persons with more income tend to join more groups. Women, having fewer resources, may tend to join groups that can mobilize fewer resources than men's.⁴

Social capital cannot be measured directly. In this study, we use membership in formal and informal groups to construct a proxy index measure. Although group membership certainly captures some elements of social capital, clearly there are other possible measures. An important area for future research is to consider such alternatives and their interaction with the group membership measures. The KwaZulu-Natal Income Dynamics Study (KIDS) survey attempted to quantify social capital in several ways other than via group membership. One of these is through measures of family networks and their use. It may be that family networks and group memberships are substitute mechanisms in the household's set of strategies. On the other hand, those with large family networks may be the best at building other group-based networks. Other possible measures of social capital in the

⁴In Maluccio, Haddad, and May (2000), which does not disaggregate social capital by gender, we address the possibility of reverse causality using instrumental variables techniques; the return to social capital decreases slightly but remains positive and significant when this is done.

survey include measures of trust, civic engagement, and violence. We have already shown that men and women belong to groups, rely on family networks, and are involved in civic activities to different degrees. We have yet to investigate, however, whether returns to participation in family networks have differential returns for men and women.

Arguably different sorts of proxy measures will capture different aspects of social capital. Furthermore, it seems likely that these different aspects will influence different types of outcomes. A second direction for future research, then, involves examining alternative outcomes (for example, different measures of household welfare including labor market participation and health indicators or the role social capital plays in dealing with economic shocks). Doing so not only will document whether social capital is associated with these outcomes but should also provide further clues for a better understanding of its underlying pathways of influence.

Gendered Participation in Water Management: Issues from Water Users' Associations in South Asia

Ruth Meinzen-Dick and Margreet Zwarteveen

The devolution of natural resource management responsibility from the state to communities or local user groups has become a widespread trend that cuts across countries and resource sectors. Unlike claims to the contrary in policy narratives, devolution of control over resources from the state to local organizations does not necessarily lead to greater participation and empowerment of all stakeholders (Clever 1999). Because the outcome of devolution programs hinges on the activity of local organizations, this study (Meinzen-Dick and Zwarteveen 1998) examines the extent and forms of women's participation in these organizations, using examples of water users' associations in South Asia. This chapter tries to draw out the main issues, illustrate them with empirical examples, and examine ways to increase women's involvement in resource management organizations.

Evidence from Water Users' Organizations in South Asia

Membership of Water Users' Organizations

Evidence from water users' organizations in India, Nepal, Pakistan, and Sri Lanka shows that women's participation in these organizations is much lower than men's, despite high involvement of women in irrigated agriculture and agricultural decisionmaking. In most cases, low female participation also

For details, see Meinzen-Dick and Zwarteveen (1998).

conflicts with official policy statements, which claim that the involvement of *all* farmers or water users is the ultimate objective. The few documented cases of a higher female involvement in water users' organizations either stem from women-only organizations managing groundwater pumps or are from areas where men were not interested or absent.

The extent of participation in organizations for resource management is the outcome of two factors: rules for membership, which determine eligibility to participate, and the balance of "costs" and "benefits" to be derived from involvement, which influence individuals' willingness and ability to participate.

The most easily recognized gender-based barriers to participation stem from membership rules that directly or indirectly exclude women. These rules either stipulate that only formal right holders to irrigated land can become members (Sri Lanka) or require head-of-household status in order to be eligible for membership, or sometimes a combination of both (Nepal). Since men tend to occupy these categories more often than women, most women are not considered eligible for membership.

Prevailing stereotypical ideas about the gender division of labor and about appropriate male and female behavior function as informal membership criteria. In India, Nepal, Pakistan, and Sri Lanka, the notion that only men are farmers and interested in irrigation, along with the traditional male domination in public decisionmaking, underlies the absence of women in water users' organizations. In addition, women are thought to be incapable of participating in meaningful ways (partly because they are less educated), and they are assumed to be busy with other, more appropriate female activities. Social norms prescribing that women confine their activities to a small geographical area may also effectively exclude women from becoming members of water users' organizations. In addition to these formal and informal membership criteria, the process through which new water users' organizations are formed in management transfer programs is often gendered, partly as a result of planners' preconceived notions about who are to be considered users and partly because of the organizing process itself.

In spite of lacking formal membership or the right to participate in meetings, women may play other roles in organizations or in collective action—they may, for example, be involved in resolving conflicts, monitoring and enforcing rules, carrying out water distribution tasks, and assisting their husbands to perform their own tasks. Such nonformal and less recognized ways of participation in water users' organizations may provide important entry points for identifying realistic ways to make water users' organizations more gender equitable.

Costs and Benefits of Participation

Because of their high domestic and productive workloads, the opportunity cost of time to attend meetings and do other work for the organizations is often higher for women than for men. It is not as easy for women to transfer some of their responsibilities to their husbands as it is for men to leave some of their tasks to their wives. The timing and location of meetings may also impose a higher cost on women than on men. Similarly, formal training held away from the village or community and requiring an overnight stay imposes a higher cost (in terms of child-care arrangements or family resistance) on women than on men.

Because of membership criteria and the process of organization, water users' organizations in South Asia have often come to be defined as predominantly male domains. Women's active participation therefore implies challenging prevailing gender norms and practices, at both the household and the community level. Also, the abilities and capacities needed for participating in organizations, and especially for office-bearer positions, may not be as easily identified with women than with men. Illiteracy, women's lack of negotiating skills, and lack of mobility may also inhibit their meaningful participation. Prestige of participation in public forums, and especially of leadership positions in the organizations, may be valued more highly by men than by women. Whether women are willing to bear these costs and face these social risks will largely depend on their assessment of the effectiveness of the organizations, and of formal participation as a means of achieving personal objectives, compared with the other means available to them.

In the Nepal Chhattis Mauja system, which is a system traditionally managed by farmers, women said that they never attended meetings of the water users' organization because the meetings offered no opportunities for them to raise their concerns and needs. In other cases the fact that women benefit indirectly from the organizations, even without participating directly, may explain why they see no need to participate more fully and formally.

Participation through Informal Domains

That female nonmembers succeed in getting their needs met indicates that not all irrigation management decisions pass through the formal organization. Instead, the water users' organization can be considered one of a number of coexisting and partly overlapping "domains of interaction" in which decisions about resource management are made, such as the household and the "field." In almost all cases reviewed, women said that if they needed anything specific to be said at water users' meetings, they would either tell their husbands or try to send a male relative. Likewise, many women

reported that they received information about decisions made at water users' organization meetings through their husbands or male relatives. When access to irrigation services is negotiated within the domain of the household, women's success in obtaining services geared to their needs will partly depend on the extent to which their specific water needs are complementary, shared, or conflictual with those of their husbands and male relatives, and on their bargaining position in household interactions.

Another important domain of interaction regarding water decisions may be the "field." Many negotiations, struggles, and conflicts regarding water take place alongside the canals, and actual water distribution is often partly determined in this domain. In such cases, water distribution follows the principle of the survival of the fittest, reflecting existing power relations. Gender as one determinant of power also affects one's ability to obtain water. Other domains of interaction that directly or indirectly co-determine women's access to and control of irrigation services may exist. Female networks (work groups as well as social groups) may be important, especially where male and female social networks are highly segregated. Individual contacts with people (mostly men) in powerful political positions can be a significant source of power. Maintaining good relationships with such people through regular courtesy visits and gifts may be an important mechanism for women to secure their access to resources.

The use of indirect means to obtain water resources is consistent with women's strategies for gaining access to other resources, such as land and trees. But gaining access through such indirect means does not provide much control over the resource or the ability to make decisions regarding its management. Relying on connections to access the resource increases women's dependence on others, whereas independent rights to resources can raise women's standing and bargaining power. Nevertheless, these socially nuanced means of access are critical to actual patterns of resource use and should not be neglected in research or policies.

To what extent women's needs are defensible in the different domains depends on their social and legal legitimacy. In the case of water needs, although the literature often refers to irrigation organizations as "water users' associations" (WUAs), they tend to include only irrigated farmers and are concerned with water deliveries to field crops. Some of the uses of water by women, such as water used for irrigating homestead gardens or watering livestock, are likely not to be included in formal water distribution plans and may thus not be considered legitimate in the domain of the WUA. In other domains (such as the household and field), the legitimacy of these needs may be greater, allowing women access to water for meeting these needs. In this

respect it is important to realize that women may have a vested interest in not being identified as users or farmers: claiming water as women (or mothers or domestic caretakers) may cause less resistance and be easier than claiming water as farmers.

The lack of participation of a large number of the users in the management of irrigation may also imply performance weaknesses in the organization, because of weaknesses in communication, representation, democracy, and accountability, which may lead to free riding, rent seeking, and corruption.

Implications for Action

The Case for Attention to Gender Differences in Community Water Management

As control over natural resources is passed from the state to local “communities,” the stakes for involving women as well as men in the management over those resources are too high to ignore gender in analysis and implementation of devolution programs. At a minimum, sustainable resource management requires that the institutions will need to ensure the compliance of all users. Given the difficulty of monitoring and enforcement in management of resources, it is likely to be easier to ensure compliance by women if they have a say in setting the rules. This approach increases the likelihood that the rules are consistent with meeting women’s needs, that women will know what the rules are, and that they will abide by the rules and enforce them. Explicitly addressing the challenge of female participation in community water management organizations is likely to lead to better and more equitable devolution policies.

Increasing Women’s Participation in Water Users’ Organizations

In South Asia, more formal participation of women in organizations will not happen automatically and cannot be left to local communities. External pressure, guidance, and intervention will often be required, and explicit financial, technical, and legal support is crucial. Existing knowledge points to some possible ways to enhance female participation. A first step involves the definition of membership rules: instead of allowing one member per household, both male and female members of households could be considered eligible for membership. Attention needs to be paid to such details as the timing, location, and structure of formal meetings, which

should reflect the importance of women's participation and allow for their opinions to be taken seriously.

The traditional way meetings are conducted or users are organized often restricts women from participating, speaking, or being listened to. Even many "participatory" approaches to eliciting community objectives (for example, discussion groups, transect walks, mapping exercises) may hinder women from articulating their interests and needs. Functional literacy training can be instrumental in overcoming women's own feelings of incompetence and inhibitions about speaking up at meetings, especially in areas where there is a large gender gap in literacy and where literacy has become an important indicator of an individual's abilities to deal with the outside world. Increasing women's experience with meetings in other types of organizations may also increase their confidence and ability to participate. In Bangladesh, India, and Nepal separate women's organizations have been identified as one successful strategy to empower women both within households and within communities. Through the women's organization, women may become more visible at the community level as well, and community decisionmaking processes may begin to alter male-oriented practices and include women and their concerns.

Control and Ownership of Assets within Rural Ethiopian Households

Marcel Fafchamps and Agnes R. Quisumbing

There is renewed interest in the intrahousehold allocation of welfare, particularly among economists studying poor countries where even slight differences in the allocation of household resources can have dramatic consequences on child and female nutrition, morbidity, and mortality (Haddad and Hoddinott 1994; Rose 1999; Dercon and Krishnan 2000). The evidence collected so far tends to demonstrate that the allocation of consumption and leisure among household members varies systematically with their relative contributions to household total income (Thomas 1990; Alderman et al. 1995; Bourguignon, Browning, and Chiappori 1995). These results, however, provide no guidance about which policies affect intrahousehold outcomes. Various efforts have been made to fill this lacuna, focusing on the determinants of intrahousehold resource allocation. Some research has emphasized the influence that “threat points”—the utility each spouse has outside marriage—are likely to have on spouses’ bargaining power and hence on intrahousehold welfare (Manser and Brown 1980; McElroy and Horney 1981). If this approach is correct, one may hope to affect intrahousehold welfare by improving the “exit options” of disadvantaged groups.

The literature has proposed two main categories of threat points, namely noncooperation within an existing household (Lundberg and Pollak 1993) and separation from the household—the exit option in Manser and Brown

For details, see Fafchamps and Quisumbing (2001). A revised version was published as Fafchamps and Quisumbing (2002).

(1980) and McElroy and Horney (1981). Support for both is found in the literature. Control over assets during marriage, including the right to decide how to allocate one's own labor effort, has been shown to affect the individual income of African women (Jones 1986; Lilja et al. 1996; Braun and Webb 1989). Some research has also demonstrated that the attribution of welfare funds to specific household members affects consumption patterns (Lundberg, Pollak, and Wales 1997). Unfortunately, progress has been hampered by the lack of hard evidence on the noncooperative options open to women in developing countries. Contrary to advanced economies where patrimonial laws regarding the control and ownership of assets within households are relatively uniform and well known, poor countries are characterized by a mix of state and customary legal systems that singularly complicate analysis. This is particularly true of patrimonial law where legal principles inherited from colonial times or introduced by enlightened elites often conflict with traditional practices and customs, especially in rural areas. The end result is a complex and opaque system in which the rules determining the ownership, control, and disposition of productive assets within households vary with location, ethnicity, and religion within the same country.

Using data from the 1997 Ethiopian Rural Household Survey (ERHS), this paper seeks to document how the control, ownership, and disposition of productive assets within households is *de facto* organized in rural Ethiopia. To our knowledge, this is the first effort to document patrimonial customs using a large household survey and rigorous statistical analysis. It complements previous efforts by legal experts and anthropologists to describe customary rules regarding marriage and assets in rural Ethiopia (for example, Bevan and Pankhurst 1996; World Bank 1998; Gopal and Salim 1999).

Ethiopia is an ideal place for this type of research because of its wide diversity of cultures and patrimonial traditions. Different religions, with widely divergent views regarding matrimonial issues in general and the status of women in particular, are well represented and, in fact, tend to dominate different parts of the country. Anthropological evidence seems to indicate that as one moves from north to south in Ethiopia, women's status, and therefore possibly their bargaining power, declines. Although the ERHS captured much of this diversity, generalizations should be viewed cautiously, given that the ethnic, cultural, and geographic makeup of the country is extremely varied and fragmented.

Theory predicts that the bargaining power of household members depends on expected utility upon divorce (which is determined by the devolution of assets) and expected utility in a noncooperative marriage

(which presumably depends on control over assets within marriage). To identify these factors, researchers have typically used a variety of measures, such as dowry and bride-price, ownership of assets at and during marriage, control during marriage, and legal rules regarding the disposition upon dissolution due to divorce or death. Because of data limitations, these measures have typically been regarded as closely related. Very little empirical evidence, however, is available on the extent to which dowry, bride-price, and assets brought to marriage can be used to predict control during marriage and division of assets upon divorce or death—the two processes thought to influence bargaining power. This study fills this lacuna using the data from Ethiopia.

Marriage and Assets in Rural Ethiopia

The 1997 ERHS covered approximately 1,500 households in 15 villages all across Ethiopia, thus capturing much of the diversity described earlier. Whereas sample households within villages were randomly selected, the villages themselves were chosen to ensure that the major farming systems are represented. Thus, although the 15 villages included in the sample are not statistically representative of rural Ethiopia as a whole, they are quite diverse and include all major agroecological, ethnic, and religious groups.

Most marriages—the majority of which are arranged—are celebrated traditionally. Only less than 10 percent of all rural marriages are celebrated in the church or municipality. Unions are formalized using a variety of customary contracts, which can be written or oral in nature. Marriage contracts vary systematically with ethnicity and religion, with, nevertheless, a lot of variation around the norm.

Since marriage typically marks the beginning of a new farm production unit, the bride and groom bring with them start-up capital in the form of land, oxen, livestock, household utensils, and grain stocks. The survey recorded all transfers to and from the bride, the groom, and their respective parents, together with all assets brought to marriage. The great majority of the new couple's assets are brought by the newlyweds themselves, with grooms bringing more than 10 times as much start-up capital as brides. Assets brought to marriage vary dramatically among couples, however, with a median of zero for most asset categories except livestock and jewelry/clothing/linen.

Contrary to the preconception that marriage is the time at which parents endow their offspring with farmland, most of the land brought in by grooms

was already theirs prior to marriage. This finding may be specific to Ethiopia, given that the state nominally owns all land. User rights over land are supposed to be allocated by Peasant Associations (PA), the local administrative unit in rural areas. Indeed, of the land user rights held by the household, two-thirds actually come directly from the PA. Family is thus not the dominant source of land for surveyed households. Of the land that comes from the family, however, most ultimately comes from the husband's parents. Women do, however, occasionally receive land from the PA, thereby suggesting a political willingness to depart from rural norms in the allocation of land to women (Gopal and Salim 1999).¹

Determinants of Control, Ownership, and Disposition of Assets

We then examined the distribution of control and ownership of productive assets—land and livestock—between husband and wife. Ethiopian rural households essentially operate farms as centralized units under the control of a single individual, irrespective of the intrahousehold division of asset ownership.² This situation is consistent with Boserup's hypothesis that as households move from hoe to plow cultivation, farm management becomes centralized because of returns to scale in management and experience.

Contrary to what is often assumed in empirical work on intrahousehold issues, the evidence shows that ownership of assets, control within marriage, and disposition upon death or divorce only partially overlap. Rules regarding divorce and inheritance vary across locations, with more patriarchal rules prevalent in the Muslim and Protestant south and more egalitarian rules prevailing in the Orthodox north.

These differences are illustrated in Table 23.1 with the help of regression analysis. The table examines the disposition of the two main productive

¹It should be noted, however, that some traditional land tenure systems in Ethiopia did recognize women as having a right to inherit from their parents. In the case of the rist land tenure system, which was prevalent in the northern part of the country, sons and daughters had an equal right to inherit land. Children of both sexes were allowed to trace their lineage through their father as well as their mother to claim land (cognatic descent). In practice, however, women's rights to land were often ignored or implicitly traded in exchange for family support.

²Important exceptions include onset-growing areas, where women seem to play a more central role in cultivation. It should be noted that, unlike cereal crops, onset cultivation does not rely on animal traction. It does rely heavily on animal manure for fertilizer.

assets—land and jointly owned livestock—upon no-fault divorce.³ Results show that location accounts for 79 percent of the explained variation in rules of disposition upon divorce.⁴ Northern locations are, in general, more generous toward women. There is systematic variation across ethnic or religious groups, but the variables are jointly nonsignificant once we control for village effects. This result suggests that the single best predictor of expected disposition of assets is the average disposition rule in the village, consistent with the idea that the disposition of assets is governed by location-specific norms. Moreover, communities may have their own ways of protecting women and other vulnerable groups; local councils may also mediate the distribution of assets should a dispute arise.

Part of the variation in rules of disposition can also be attributed to differences in marriage contracts, although the effect is jointly significant only in the case of land. The presence of a marriage contract in general protects women, but the effect becomes less significant once we control for location, ethnicity, and religion. We also investigate whether expected rules of disposition upon divorce vary systematically with assets brought into marriage, inherited assets, and individual ownership of assets at the time of the survey. To the extent that premarital assets and individually owned assets are earmarked to a particular spouse, we would expect this to be reflected in the disposition of assets upon divorce. Such a scenario is important because, if spouses recover their premarital and inherited assets when they separate, exit options and thus threat points are largely determined in the marriage market. In this case the position of women during marriage is likely to be weakened by the fact that they are disadvantaged in the attribution of premarital assets. In contrast, if premarital assets fall into a common pool, women should fare better, on average. Of course, even if the woman recovers her share of assets upon divorce—say livestock—she may be forced to remarry to gain access to other complementary assets such as land.

Results show that land inherited or brought into marriage by one of the spouses affects the disposition of land and livestock upon divorce. Women

³We focus on the three dominant modes of devolution: all to husband, all to wife, and shared equally between spouses. The dependent variable is the wife's share, which by construction can only take three values: 0, 0.5, and 1. For this reason, ordered probit is used as estimator.

⁴This figure was calculated as the ratio of R^2 of regression of disposition on village dummies divided by the R^2 of the regression using all the regressors included in Table 23.1. By coincidence, we obtain the same ratio for livestock and land.

Table 23.1 Regression analysis of disposition of assets upon divorce (currently married households only; estimator is ordered probit)

	Share of livestock going to wife (coefficient)	Share of land going to wife (coefficient)
Assets brought to the marriage (log value +1)		
Premarriage land of husband	-0.023	-0.056***
Premarriage livestock of husband	0.002	0.013
Other assets brought to marriage by husband	-0.003	0.019
Inherited land of husband	-0.010	-0.016
Premarriage land of wife	0.100**	0.210***
Premarriage livestock of wife	-0.018	-0.031
Other assets brought to marriage by wife	-0.017	-0.102
Inherited land of wife	0.094***	0.008
Asset ownership during marriage		
Share of land user rights of wife	0.600*	1.244***
Share of livestock owned by husband alone	-0.449***	-0.738***
Share of livestock owned by wife alone	0.727**	0.444
Marriage contract dummies		
Samanya (always written)	0.582**	0.236
Nika (written or verbal)	0.052	-0.271
Cheb (written or verbal)	0.334	0.560
Kalkida (verbal)	0.619**	1.219***
Other contract (written or verbal)	0.490*	0.608
Personal characteristics		
Husband's age	0.004	0.016
Wife's age	0.008	-0.005
Husband's education	-0.015	0.015
Wife's education	0.070	0.116**
Children and marriage history		
Number of children from current union	-0.006	0.017
Husband's children from previous union	-0.003	.028
Wife's children from previous union	0.007	-0.034
Whether wife was previously married	0.026	-0.388**
Number of observations	751	775
Pseudo R-squared	0.373	0.589
Joint significance tests		
	Chi-square statistic	Chi-square statistic
Assets brought to marriage by husband	2.15	8.11*
Assets brought to marriage by wife	14.96***	23.33***
Asset ownership during marriage	16.23***	25.51***
Marriage contract	7.23	10.28*
Personal characteristics	5.26	8.44*
Children	0.11	1.52
Ethnicity	3.55	1.85
Religion	2.32	4.09
Village fixed effects	75.81***	50.53***

Notes: Regressors include dummy variables for ethnicity, religion, and villages. *indicates significant at the 10 percent level; **indicates significant at the 5 percent level; and ***indicates significant at the 1 percent level.

expect to receive more land and commonly held livestock upon divorce if they brought in some land. Conversely, they expect to get less if their husband brought a lot of land into the marriage. Ownership of productive assets at the time of the survey also affects rules of disposition. Women who individually own more livestock and hold user rights on a larger share of the household's land expect to receive more upon divorce. Since individual ownership of productive assets during marriage is closely related to control and management of these assets, and thus to female headship in married couples, this situation implies that female heads of household expect to receive significantly more productive assets upon divorce than women in male-headed households. Once we control for assets, personal characteristics of the spouses, such as their age and education, have little effect on disposition upon divorce, except that better-educated wives expect to receive more land.

We also examine the determinants of inheritance. Since the surviving spouse nearly always inherits part or all of the land and livestock acquired during marriage, we focus on whether wives inherit all land and livestock or have to share with other heirs, principally children. Given that the dependent variable is dichotomous, logit is used as estimator. Coefficients are presented in the form of an odds ratio: a ratio smaller than one means that the variable reduces the chance of inheritance; a ratio greater than one increases it. Because there is less variation in the dependent variable, some regressors have to be dropped. In this case, we did not include the assets at marriage variables because they were not significant. In contrast to the case of divorce, assets brought to marriage do not significantly affect disposition at death.

Results are less conclusive than for divorce, but they nevertheless show large differences across locations and between various ethnic and religious groups, although religion dummies are not jointly significant (Table 23.2). Location alone accounts for 65 percent of the explained variation in inheritance. Women in the south, principally among the various south-central ethnic groups, are less likely to inherit land and livestock. This situation is partly compensated by the fact that non-Orthodox women are more likely to have exclusive inheritance rights to land and livestock.

The presence of children from previous marriages has a strong effect on inheritance expectations: women with children of their own are more likely to inherit all land and livestock, while those whose husband has children of his own are less likely to inherit. This finding is consistent with the idea that women with children from previous unions are allocated land as a form of child-care provision. Ownership of assets during marriage has little effect on

Table 23.2 Regression analysis of disposition of assets upon death of husband (currently married households only; estimator is logit; coefficients are reported as odds ratios)

	Odds that wife inherits all jointly owned livestock	Odds that wife inherits all land
Children and marriage history		
Number of children from current union	1.022	0.987
Husband's children from previous union	0.913**	0.907***
Wife's children from previous union	1.318***	1.304***
Whether wife was previously married	0.828	0.744
Asset ownership during marriage		
Share of land user rights of wife	0.812	0.634
Share of livestock owned by husband alone	0.703	0.586**
Share of livestock owned by wife alone	0.781	1.016
Personal characteristics		
Husband's age	1.012	1.022*
Wife's age	0.977	0.965**
Husband's education	1.008	1.043
Wife's education	0.896	0.886*
Ethnicity		
Amhara	0.889	0.713
Oromo	0.507	0.425
South-Central ethnic groups	0.132***	0.119***
Other ethnicity	0.348*	0.306*
Number of observations	783	804
Pseudo R-squared	0.129	0.212
Joint significance tests		
	Chi-square statistic	Chi-square statistic
Asset ownership during marriage	2.38	5.56
Marriage contract	10.94**	3.14
Personal characteristics	4.77	7.59
Children	13.98***	13.78***
Village fixed effects	47.34***	74.16***
Ethnicity	11.69**	11.00**
Religion	1.29	4.91
Religion	1.29	4.91

Notes: Regressors include dummy variables for type of marriage contract, religion, and villages.

* indicates significant at the 10 percent level; ** indicates significant at the 5 percent level; and

***indicates significant at the 1 percent level. Virtually identical results are obtained using conditional logit.

inheritance expectations, except that women are less likely to inherit all household land if their husband owns more of the household livestock. Surprisingly, most marriage contracts are correlated with weaker inheritance rights for women. The effect, however, is generally not significant. One possible interpretation is that the presence of a marriage contract signals an

intention to create a stable marriage and to have children, and is thus related to the expectation that a surviving wife will share household assets with children upon the death of her husband.

Personal characteristics also affect inheritance. Women married to older men expect to get more land, possibly because they plan to take over the farm. Older wives anticipate getting fewer assets, perhaps because they are supposed to be taken care of by their grown-up children. Educated women expect to receive fewer assets as well. The reason is unclear. Perhaps they can support themselves in other ways such as nonfarm work, but this is far from certain, given the very low level of nonfarm activities in rural Ethiopia. This topic deserves more research.

Control over productive resources tends to be centralized into the hands of the household head, be it a man or a woman, irrespective of ownership at or after marriage. Having control over productive assets has a strong effect on disposition rules in the sense that the spouse with greater control over an asset gets a larger share upon divorce or death. This result holds true even after we control for assets brought to the marriage. This finding is important because it brings to light another way by which the bargaining power of women may be affected. It is also what one would expect if households wish to provide sufficient incentives for the farm manager to take good care of land and to invest in productive assets such as oxen and livestock.

Policy Implications

Our findings suggest that assets brought to marriage, eventual control of the asset, and local norms are important in determining the distribution of productive assets between husband and wife in the case of divorce. Policy can influence women's control over assets. For example, in their land allocation function, local administrations have been willing to grant user rights to women, though perhaps reluctantly. This is so even though in local customs, women hardly ever inherit land from their lineage. The government's "land to the tiller" policy thus allowed—or may even have facilitated—the attribution of user rights over land to women. This attribution, however, nearly always results from conditions internal to the household, such as separation or death of the husband; in most cases women's access to land remains conditional upon the absence of a suitable male head of household.

Another indication that external intervention may have an impact on local customs is the observed link between the concept of fault-based divorce and conversion to a non-Orthodox Christian faith. The spread of

Catholicism and Protestantism to rural Ethiopia is indeed fairly recent, particularly in the south. Yet it seems to be correlated with a fault-based concept of divorce—or more precisely with the perception that fault plays an important role in financial settlement upon divorce.

Finally, to get a complete picture of women's welfare in rural Ethiopia, women's individual rights, which we covered here, must be considered in combination with informal entitlements that take care of women in more roundabout (and paternalistic) ways. These issues will be the objects of future research.

Women's Land Rights in the Transition to Individualized Ownership: Implications for the Management of Tree Resources in Western Ghana

Agnes R. Quisumbing, Ellen Payongayong, J. B. Aidoo, and Keijiro Otsuka

This study explores the impact of changes in land tenure institutions on women's land rights and the efficiency of tree resource management in western Ghana, where cocoa is the dominant crop. Although communal land tenure aims to provide equitable access to land for all households, women's land rights in the region are weaker than those of men, as is often the case under customary land tenure systems (Lastarria-Cornhiel 1997). If women are blocked from having secure land rights, and therefore from individualized investment in land, the resulting barrier to increased productivity will diminish their incentives to sustain resource use over time (Meinzen-Dick et al. 1997).

Communal land tenure institutions may evolve toward greater individualization and more secure individual land rights because of population pressure and the need to intensify agricultural production (Ault and Rutman 1979; Bruce and Migot-Adholla 1993). The Akan households in the region, for example, have granted relatively strong individual ownership rights to those who plant trees. Under such institutional rules, a community member who has acquired family land through inheritance and allocation may have strong incentives to plant trees in order to obtain secure land rights. Whether these rights differ between men and women may have important consequences for equity and the efficiency of forest resource management.

For further details, see Quisumbing et al. (2001a, b).

Land Tenure in Western Ghana

This study is based on an extensive survey of 60 villages in the most active cocoa-growing regions in Ghana. The whole area is under customary land tenure, and all land is ultimately controlled by the village chief on behalf of the community. The dominant ethnic group in these villages is the Akan (87 percent of sample households). While Akans have traditionally followed matrilineal inheritance, the mode of land transfer has been evolving over time. Appropriated village land is increasingly being transferred directly to wives and children, and even family land is often transferred to them with the consent of family members, particularly after the land is planted either wholly or partially with cocoa trees. Such transfers while both parties are still living, or *inter vivos* transfers, are termed “gifts” in the study areas, and individual rights on such land are firmly established.

Land rights are more clearly individualized among migrants, who either have nuclear families or practice patrilineal inheritance, by which a relatively small number of sons within a single family is qualified to inherit the father's land. Women's inheritance rights were strengthened by the passing of the Intestate Succession Law (ISL) in 1985, which allows children and wives to gain access to land that they were previously denied under traditional law. Under the ISL, the estate of a man who dies without leaving a will is divided as follows: three-sixteenths to the surviving spouse, nine-sixteenths to the surviving children, one-eighth to the surviving parent, and one-eighth in accordance with customary inheritance law (Awusabo-Asare 1990). The common interpretation of the ISL, however, is one-third each for the spouse, children, and matrilineal family.

Determinants of Land Tenure and Acquisition

Analysis of what determines land tenure at the village level shows that population pressure first induces institutional innovation toward individualized land tenure. Gifts, moreover, allow villagers to circumvent the traditional inheritance rule in matrilineal society, by allowing wives and children to receive property directly from husbands. The patrilineal migrant population, however, acquires cultivation rights mainly by renting land or sometimes by purchasing land from indigenes.

The study also shows what determines land acquisition at the household level. A Ghanaian man follows a sequential decisionmaking process with respect to land acquisition over his life cycle: if forest land is available, he

acquires it through clearance when he is young; he acquires the family land through inheritance, allocation, and gift when he gets married; and later he acquires the additional land through renting and private purchase. Table 24.1 presents regressions on the determinants of land acquisition at the village level, controlling for unobserved village-level factors. These regressions show that women have a relative disadvantage in acquiring land through forest clearance because it is a male activity. Female heads of households are also significantly less likely to have obtained land through purchase and rental, suggesting that they may be disadvantaged, relative to men, in land sales and rental markets. Female heads of households appear disadvantaged in all modes of land acquisition, although their relative disadvantage is less significant for acquiring family land.

Table 24.1 Determinants of land acquisition at the household level: Tobit regression with village fixed effects

	Forestland	All family land ^a	Purchased, rented, or borrowed non-forestland
Forestland			-0.41*
Family land			-0.71*
Age of household head	7.65**	0.17*	0.15
Year of first marriage of household head	-0.98	0.11*	-0.35
Dummy for household head born outside of village	54.39*	-5.16**	9.41*
Years of schooling of head	-6.42*	0.44**	0.39
Dummy for female-headed household	-65.08*	-0.79	-16.98
Dummy for patrilineal household	-87.20**	-4.83**	0.90
Chi-square	30.4	222.2	30.3
<i>p</i> -value	0.0	0.0	0.0
Number of observations	386	386	386

Note: Least absolute deviations estimator. ** indicates significant at the 1 percent level, and * indicates significant at the 5 percent level, one-tailed tests.

^aFamily land includes allocation, inheritance, and gifts.

Determination of Cocoa-Tree Planting

How does land tenure affect the management of land in terms of the proportion of area planted to cocoa and yield per unit of cocoa-planted area? We hypothesize that cocoa-tree planting is more profitable than shifting cultivation and that higher cocoa yields indicate higher production efficiency, both of which seem reasonable in view of the continued expansion of cocoa area. We assume that the distribution of parcels by land tenure type is predetermined for each household but may differ within each household, depending on the gender of the parcel owner and the mode of land acquisition.¹

Table 24.2 presents regressions on the proportion of cocoa-planted area as well as cocoa yields at the plot level. Parcel size is shown to have an extremely significant and negative effect on the proportion planted to cocoa, implying that an inverse correlation exists between parcel size and tree planting. This finding shows that the land rental market, not to mention the land sales market, is imperfect, because some portions of the parcel could have been rented for tree planting if the land rental market worked effectively.

A more important finding is that the dummy for allocated family land has a positive and significant effect on tree planting. It seems that the expected strengthening of land rights associated with tree planting provides strong incentives to plant trees on allocated family land. Dummies for land parcels with strongly individualized ownership, that is, gift, appropriated village land, purchased village land, and purchased private land, all have positive coefficients, but only the dummy for purchased private land is significant. The dummy for a female parcel owner has a negative but insignificant effect on the proportion of area planted to cocoa, suggesting that there is no significant difference between male and female parcel owners with respect to tree planting. If women receive land only after a large portion of it has been planted to cocoa, as our field observations suggest, subsequent observations will not reveal any difference in the probability of planting cocoa between male and female parcel owners. The percentage of parcel area planted to cocoa is positively related to the percentage of cocoa area at acquisition. The

¹To control for possible correlation between land tenure variables and unobservable household characteristics (which may affect the distribution of parcels by tenure), we applied the household-level fixed-effects model for both the proportion of area planted to cocoa and cocoa yields. For comparison, and to test for the importance of parcel-level heterogeneity, we also applied the random effects model to the estimation of the cocoa yield function.

Table 24.2 Determinants of proportion planted to cocoa and cocoa production per hectare at the parcel level, selected coefficients

	Proportion planted to cocoa on plots with mature cocoa (Tobit with household dummies)	Yield (production/cocoa area)	
		Household fixed effects	Household random effects
Distance to parcel	0.156	-18.364*	-11.123*
Parcel size (hectares)	-0.028**	-3.483	-1.584
Dummy for female-held parcel	-0.049	-74.902	-74.147
Percentage cocoa area at acquisition	0.453**	-46.308	-53.337
Land tenure dummies			
Dummy inherited and patrilineal	-0.228	-90.667	39.370
Dummy allocated family land	0.214*	-147.425*	-116.241*
Dummy allocated family and patrilineal	-0.182	-98.569	-13.576
Dummy land received as gift	0.103	-87.839	-55.874
Dummy gift and patrilineal	-0.171	48.031	15.412
Dummy appropriated village land	0.191	-128.019	-88.430
Dummy purchased village land	0.210	-98.686	-16.767
Dummy privately purchased land	0.247*	-156.347	-98.131
Dummy rented land	0.206 *	-167.470*	-133.855*
Dummy ownership through renting	0.379**	-99.311	-69.391
Log-likelihood	-73.92		
Chi-square	393.47		
<i>p</i> -value	0.00		
Breusch-Pagan Langrangian Multiplier Test (<i>p</i> -value)			34.12 (0.00)
Hausman Specification Test (<i>p</i> -value)			21.90 (0.29)
Number of observations	391		391

Note: Regressions included controls for tree characteristics in the yield regressions, years since acquisition of the parcel, percentage forest area at acquisition, and the real cocoa farmgate price at acquisition, and, for the random effects specification, family-level variables such as sex and age of the household head, years of schooling of the household head, a dummy for a patrilineal household, household size, and the total landholdings of the household. ** indicates significant at the 1 percent level, and * indicates significant at the 5 percent level, one-tailed tests

importance of previous tree planting as a prerequisite for receiving gifts, however, appears to differ by gender. Other results show that men had to plant only 20 to 25 percent of a parcel of land with cocoa trees before the land was transferred to them as a gift. Women, however, had to plant between 40 and 50 percent of land to cocoa before acquiring it as a gift.

We also estimated cocoa yield functions with household fixed and random effects. The estimation results of the cocoa yield function contrast markedly with those of tree planting. First of all, for both fixed- and random-effects results, the dummy for allocated family land is negative and significant. Thus, tree planting density and subsequent management intensity of cocoa trees are lower in allocated family land, even though the proportion of tree-planted area is larger. Such behavior is understandable if one plants trees in order to obtain permission to transfer land as a gift. This finding is confirmed by field interviews that suggest the practice of “strategic planting” of cocoa trees to preserve permanent rights, even if the farmer cannot maintain the trees.

Second, the coefficient of the dummy variable for current renting is negative and significant in both fixed- and random-effects specifications. Contrary to the conjecture of Boadu (1992), share tenancy in Ghana’s cocoa fields is found to be inefficient. This finding is consistent with the finding of an inverse correlation between parcel size and the proportion of area planted to trees, because it is not necessarily advantageous for a landowner to rent out a portion of a large parcel to a tenant if tenancy is inefficient.

Third, the coefficients of dummy variables representing gift, appropriated and purchased village forest land, and purchased private land are all negative, even though none of them are significant. If stronger land tenure security leads to sufficiently greater incentives to invest in management of trees, the coefficients of these dummy variables ought to be positive and significant. It may well be that once cocoa trees are planted, individual land rights are enhanced such that management incentives do not differ significantly among various land tenure institutions. This result is consistent with the finding of Place and Hazell (1993) that land tenure security does not significantly affect crop yields in several Sub-Saharan African countries.

Lastly, the dummy for female-owned parcels is negative, though only weakly significant in the random-effects specification. This finding shows that, controlling for differences in land tenure and accounting for unobserved heterogeneity, female parcel managers obtain lower yields on their cocoa plots. This finding is similar to that of Udry’s (1996) study on Burkina Faso, which finds lower yields on maize plots cultivated by females within the same household. Although this result may indicate greater credit and labor constraints faced by female farmers, it also suggests inefficiencies in intrahousehold resource allocation, since the household could have increased aggregate yields by reallocating resources across male- and female-managed plots. It may also reveal that female parcel owners may concentrate more on the food crops grown on cocoa plots rather than on cocoa itself.

To sum up, the contrasting estimation results of cocoa tree planting and cocoa yield functions can be understood only if land rights are enhanced by tree planting, so that incentive structures are different for tree planting and management of trees. Incentive structures may also be different for male and female farmers within the same household.

Conclusions

The evolution toward individualized land-tenure systems in western Ghana has been facilitated by the stipulation of customary land tenure institutions that those who exert efforts to clear forests and plant trees will receive individual parcels of land. Some researchers argue that such evolutionary changes have detrimental effects on women's traditional land rights. Although this argument may be true in some societies, this study shows that in western Ghana, a wife who labors on a husband's cocoa plot usually receives a gift of land. This method is the most important mode of land acquisition for women. Legal reform has also provided women a means of obtaining access to the husband's land should he die intestate.

Given the need for agricultural intensification to meet demand and growth objectives, a major question arises: What types of policies can assist such evolutionary changes in a manner compatible with efficient and equitable development of rural areas? Land titling is feasible only if land rights are sufficiently individualized, but implementation of land-titling programs must pay special attention to gender issues. If men are traditionally owners of land, as in western Ghana, land titling may strengthen their land rights at women's expense. To be fair, men and women should be equally qualified to acquire land titles. Judging from the experience of Ghana, the promulgation of the 1985 Intestate Succession Law is likely to be an effective policy option for facilitating less gender-biased land inheritance systems in customary land areas. But attempts to equalize land rights of men and women will lead to gender equity and the improved efficiency and productivity of women farmers only if other constraints faced by women are also addressed.

PART 5

Policies and Interventions

Policies and Interventions: Overview

Agnes R. Quisumbing

The early work on intrahousehold allocation alerted researchers and policymakers to the possible policy failures that could arise from neglect of intrahousehold allocation issues (Haddad, Hoddinott, and Alderman 1997). Conversely, what are the policy gains from paying attention to these issues? The new research on intrahousehold issues provides evidence that policies and interventions can be made more effective when differential rights, resources, and responsibilities within the household are explicitly considered.

First, it is possible to identify the appropriate individual to whom to target the intervention. In the case of a new generation of income-transfer programs like Mexico's *Programa Nacional de Educación, Salud y Alimentación* (PROGRESA), the intrahousehold literature was very influential in the targeting of cash transfers to the mother in the household (Skoufias and McClafferty, Chapter 29; Adato et al., Chapter 30). The results from the PROGRESA evaluation have inspired similar programs giving income transfers to the mother in other countries in Latin America.

Second, research findings have alerted policymakers to the possibility that nonrecipients of income transfers may respond in ways that dilute the intention of the transfer. Whether this in fact happens is an empirical question. PROGRESA does not seem to have any depressing effect on adults' work incentives, while the award of cash benefits to mothers has led to the empowerment of women. In general, husbands appreciate the benefits that PROGRESA brings to their families, even if they express concern about their wives' time commitments. In Bangladesh, although there have been reports of appropriation of funds and incidents of domestic violence from

husbands whose wives participate in microcredit schemes, the incidence of violence against women may have decreased overall (Schuler, Hashemi, and Riley 1997). Women's participation in the expanded set of social relationships arising from membership in credit organizations, rather than their economic contribution per se, explains most of the reduction in domestic violence. In the Philippines Jacoby (2002) finds that children participating in a school feeding program received the same diet at home as nonparticipants. Thus the program had a net benefit for children's nutrition, but it did not provide an income transfer to the family.

Awareness of the response of nonrecipients may be crucial to reducing resistance from nonrecipients, as well as obtaining their cooperation. Focus groups conducted as part of the PROGRESA evaluation revealed that most men accept women's role in the program because the benefits help the husband too, and the family as a whole (Adato and Mindek 2000). Including men in initial PROGRESA general meetings where beneficiary responsibilities and program activities are explained has also been helpful in increasing men's acceptance of the program. Where highlighting the benefits of the program to the family as a whole does not suffice to induce men's cooperation, some programs have employed the possibility of legal sanctions. In some livestock transfer programs of Heifer Project International in Kenya (Miller 2001), some women's groups maintain legal ownership of animals distributed to individual households. The group may remove them from homes where a husband treats his wife badly. This legal threat of removal can help decrease violence and divorce. Nevertheless, the most successful projects are those that have obtained husbands' support for women's activities.

Third, project performance can improve if information and other program inputs are better targeted to beneficiaries. Community mobilization and women's groups are now a standard feature of many development interventions, as the PROGRESA example and studies of microfinance demonstrate. And fourth, and possibly most important, attention to intrahousehold issues brings into play a whole range of policy levers such as changes in formal and informal legal institutions, credit, educational reform, and changes in access to communal property resources. Considering the possible gender-differentiated effects of policies and interventions, especially at the macro level, would also alert policymakers to possible distributional effects of policies on men's and women's well-being.

It is important to note that the gender-differentiated impact of public policy is very much an empirical question. Rather than assume that interventions will not have differential effects on individuals within the household, it is better for project designers to pay attention to possible

differences in rights, resources, and responsibilities within the household and for project evaluators to examine whether these differences will affect project performance. It is also possible that some interventions, although targeted to the household, may have favorable effects on gender equity, as in the case of the Food for Education program in Bangladesh. Without evaluations and empirical research, these gender-differentiated impacts may go unnoticed. At the macro level, rather than assume either that macroeconomic policies are gender-neutral or that they will unequivocally harm women, it is better for macro planners to examine the potential gender-differentiated impact of different types of macroeconomic and trade policies. Stronger links between project design, monitoring, and evaluation, and between policy and research, may emerge as intrahousehold issues are more seriously taken into account in project design and implementation. Policies and interventions can be strengthened and made more effective from the project up to the macro level.

Most of the chapters in this section focus on policies and interventions that increase women's control over resources. Smith et al. (Chapter 26) classify these policies and interventions into two types: (1) those that eradicate discrimination against women, and (2) those that more actively promote "catch-up" by targeting resources directly to women. This chapter is followed by five chapters on programs that fall into the second category: one on microfinance programs targeted to women (Sharma, Chapter 27), one on the Food for Education program in Bangladesh (Ahmed and del Ninno, Chapter 28), two on a large multisectoral conditional income transfer program in Mexico (Skoufias and McClafferty, Chapter 29; Adato et al., Chapter 30), and one on public support of community day-care centers in Guatemala City (Ruel et al., Chapter 31). The last two chapters look at the macro and long-term effects of policy on intrahousehold resource allocation. Chapter 32 by Fontana uses a gender-disaggregated macro model to simulate the effects of various trade policies in Zambia. Chapter 33 by Quisumbing, Estudillo, and Otsuka examines the longer-term effects of parental investment in children's education and land inheritance on their lifetime incomes.

Contribution of Each Chapter

Chapter 26 (Smith et al.) gives a comprehensive introduction to the range of programs that can increase women's status. It provides examples of public policy, cross-classified according to policies that eradicate discrimination or proactively promote catch-up in women's status. It discusses four programs

that proactively promote catch-up in women's status; these programs are presented in greater detail in succeeding chapters.

In Chapter 27 Sharma synthesizes the arguments for targeting microfinance to women, discusses the ambiguities behind such arguments, and reviews the empirical evidence of the impact of microfinance on women's empowerment. Microfinance programs have been targeted to women based on two premises: (1) that microfinance is an effective tool in improving women's status; and (2) that overall household welfare is likely to be higher when microfinance is provided to women than to men. The chapter argues, however, that several ambiguities underlie these arguments. Positive empowerment effects cannot always be guaranteed, and men may simply use women as instruments for obtaining credit that the men control.

Most of the empirical evidence regarding the gender-differentiated impact of microfinance comes from Bangladesh, where careful studies that control for selection bias show that welfare impacts—household consumption, nutritional status, and education of sons and daughters—are significantly better when borrowers are women. Conclusions regarding the effect of credit on women's empowerment are more ambiguous, partly because studies have had to use proxy indicators of empowerment, which are both a cultural and a personal concept. Despite these shortcomings, the review shows that credit seems to have positive impacts on a number of empowerment indicators such as involvement in major family decisionmaking, participation in public action, physical mobility, political and legal awareness, and the ability to make large and small purchases. The review ends with some recommendations for improving service delivery, financial sustainability, and replicability of microfinance programs, particularly in cultural settings other than Bangladesh.

Chapter 28, on food for education (Ahmed and del Ninno), illustrates how a program that was designed to increase school attendance of children of poor families can have a greater impact on girls' schooling, thereby helping to close the gender gap in education. Under Bangladesh's Food for Education (FFE) program, a free monthly ration of foodgrains is an income entitlement enabling a child from a poor family to go to school. The family can consume the grain, thus reducing its food budget, or it can sell the grain and use the cash to meet other expenses. FFE has indeed been successful in increasing primary school enrollment, promoting school attendance, and reducing dropout rates. Moreover, the enrollment increase was greater for girls than for boys. The program significantly increases calorie and protein consumption in the beneficiary households, even after controlling for effects of income and other factors. FFE alone, however, does not improve the

nutritional status of preschool-age children and women, the most vulnerable members of beneficiary households. The chapter concludes with a number of recommendations to improve school quality as well as the efficiency, targeting, and nutritional impact of the program.

The next three chapters, based on evaluations in Latin American countries, are interesting not only for their findings, but also for the research methods used. The PROGRESA evaluation illustrates the returns to building program evaluation into the implementation of the program (Chapter 29, Skoufias and McClafferty). Because of the large scale of the program, it would have been impossible to implement the program at the same time in all its target municipalities. Program designers took advantage of this to randomize poor communities into treatment and control categories, allowing for the comparison of beneficiary households with a control group that is similar in every respect but does not benefit from the program. Researchers were also able to use repeated observations on households and their members to look at changes before and after the program. The PROGRESA evaluation also relied heavily on qualitative methods to elicit the views of service providers, community mobilizers (*promotoras*), and the beneficiary women themselves (Chapter 30, Adato et al.).

PROGRESA has significantly increased the enrollment of boys and girls, particularly girls, and above all, at the secondary level. The program has also had significant positive effects in health, nutrition, and food consumption. The program has empowered women by putting additional resources under their control, giving them greater control over their movements, educating them on health and nutrition issues, providing new spaces in which to communicate with other woman, educating girls to improve their position in the future, and increasing their self-confidence and self-esteem.

Ruel et al.'s evaluation of the Guatemala Community Day-care Program—a government subsidized program that trains mothers to provide day-care services in their homes in the slums of Guatemala City—uses both qualitative and quantitative evaluation methods as well as two types of quantitative surveys (Chapter 31). The use of interviews, eight-hour observations in the day-care centers, and focus groups with caretakers, beneficiary parents, and supervisors enabled the researchers to obtain the views of both providers and receivers of this service. Moreover, a matched sample of children and a random sample of mothers of preschoolers made it possible to determine program impact as well as to take into account factors affecting a woman's decision to work and her choice of child-care provider.

The evaluation revealed that the program reached its targeted audience—families of working parents with poor resources, and particularly families in which mothers are the main income generator. The program also had a positive impact on children's nutrient intake and dietary diversity. Controlling for the jointness of the decision to participate in the labor market and to use formal day care, the price of formal day care has negative but insignificant impacts on mothers' earnings. This finding suggests that interventions to increase the availability and lower the time costs of formal day care in poor urban areas have the potential to raise labor-force participation rates of mothers residing in such neighborhoods but not necessarily their earnings, conditional upon their having entered the labor force.

Chapter 32 by Fontana is in the frontier area of macro-micro linkages. Although the debate regarding the impact of globalization and trade on women has been active, relatively few studies provide sound empirical evidence on the positive or negative impacts of trade on women, their quality of life, or their position in the workplace and the family.¹ Moreover, most studies analyze the impact of trade on women without examining feedback effects from the micro to the macro level. This chapter examines the gender-differentiated impact of trade and macroeconomic policies in Zambia. It analyzes two main trade-related strategies: the abolition of tariffs on manufactured imports and nontraditional agricultural export promotion. Unlike other macro models that look only at very broad economic aggregates, the model differentiates workers by both gender and education and accounts for land as well as for capital. It distinguishes four household types by income level and location and estimates for each of them social reproduction (or household work) and leisure. This level of detail permits an understanding of how women's characteristics and circumstances mediate the eventual impact of macroeconomic policy changes. The consideration of household work and leisure as components of aggregate output is crucial to examining the effects of trade policies on men's and women's well-being, since women's contribution to housework is often uncounted in national accounts and leisure is rarely considered an element of welfare in macro

¹Recent exceptions are the work of Deere et al. (1990) on the effects of the economic and debt crises on women in the Dominican Republic and Jamaica; Tiano (1994) on the effect of globalization—the spread of the Mexican maquila industry—on women workers; Safa (1995) on the impact of paid industrial employment on women workers in Cuba, the Dominican Republic, and Puerto Rico; and Gladwin and Thompson (1995) on the impact of Mexico's trade openness on women's quality of life and satisfaction with life based on a longitudinal study of 50 families in southern Mexico.

models. The study also explores how gender-differentiated market imperfections and structural limitations at the household level may affect the impact of trade policies.

The last chapter in this volume examines the implications of changes in inheritance patterns over time on the lifetime incomes of sons and daughters, illustrating the potential long-term impact of policies that alter the distribution of resources between boys and girls. The study by Quisumbing, Estudillo, and Otsuka (Chapter 33) uses retrospective surveys to obtain information on three generations—a range necessary for examining the impact of changes in inheritance practices over the long term. Retrospective surveys have proved to be very useful in obtaining information on assets at marriage (used in much of this research program), social capital, and land acquisition patterns, and they have been used throughout this research program. Although panel data would have been ideal, it is only relatively recently that panel data with gender-disaggregated information have become available for a number of developing countries.

The study finds that while gender differences in land inheritance and schooling reflect sons' and daughters' comparative advantage in farming and nonfarm employment, parental incentives to invest in daughters differ in all three countries. In the Philippines daughters receive more schooling and sons receive more land, but lifetime incomes are equalized because of daughters' higher probability of working in the nonagricultural sector. In Sumatra, a matrilineal society, the gender gap in education is closing while sons are gradually inheriting agroforestry land. Lifetime incomes are generally equalized in Sumatra between men and women, and changing the distribution of land and education does not have a significant impact. In Ghana both the distribution of land and schooling are biased against women. Increasing women's education does not improve lifetime incomes, however, because of low returns to women's education in farming. Development of the nonagricultural sector and removal of barriers to women's participation in the nonagricultural sector may be key to increasing parental investment in daughters' education.

Key Messages

1. Public policy can take many actions to improve women's status relative to men, but the specific set of actions that are most appropriate will be context-specific. These actions range from policy reform to eradicate gender discrimination to more active promotion of catch-up in women's

status. The latter category includes programs that are designed to target women such as targeted credit, food for girls' education, targeted cash transfers, subsidized day care, and nutrition interventions.

2. Microfinance programs targeting women have a strong potential to empower women who have very little command over household and societal resources. For empowerment to be significant and lasting, however, financial products and institutional packages need to be tailored to the specific local preferences and skill bases of women. Institutions used to draw women into microfinance programs must respond to preexisting social and cultural constraints and will have to be adapted to specific cultural settings.
3. Programs that transfer income to families to encourage children to attend school may have a larger impact on girls' enrollment. The benefits from such a program could improve women's status by equalizing women's and men's human capital. Encouraging girls to stay in school may also lead to delayed marriage, with important implications for women's life opportunities.
4. Human capital investment programs with income transfers directed to women are a powerful tool for improving human capital outcomes of children as well as women's decisionmaking power within the household.
5. Increasing the supply of affordable, high-quality day care may be key to increasing women's labor force participation and earnings in urban areas where formal sector employment is important. It is especially important for poor women who are the sole income earners of their families.
6. Understanding how macroeconomic and trade policies affect men's and women's time spent in household tasks and leisure is important in understanding the effects of macroeconomic policy on individual well-being. When there is great rigidity in gender roles, as well as in market structures, the positive effects of better price incentives are likely to be small. It is thus important to design complementary policies to reduce the many competing demands on women's time and to enhance their ability to respond to economic reforms.
7. Eradicating discrimination against women in property rights and education increases incentives for parents to invest in daughters. Investment in women's education is key to increasing their lifetime incomes and facilitating their movement into the nonagricultural sector, where returns may be higher than in the agricultural sector. It is therefore important to remove barriers to women's access to nonagricultural employment.

Public Policy to Improve Women's Status

Lisa C. Smith, Usha Ramakrishnan, Aida Ndiaye,
Lawrence Haddad, and Reynaldo Martorell

Policymakers have many options for improving women's status relative to men's. The most appropriate set of actions in a given situation will naturally be specific to that context. This chapter outlines some policy actions that have proven successful, as summarized in Table 26.1, and gives some examples of their implementation.

Eradicating Discrimination

Policy reform to eradicate gender discrimination promotes gender neutrality by creating a level playing field for women and men. At a basic level, improving women's *political voice and participation* is vital to any fundamental shift in women's status. Women's human rights—political, civil, economic, social, and cultural—must be respected, protected, and fulfilled. The strengthening of democratic institutions through legislation, the rewriting of constitutions so that they explicitly disavow discrimination, and the reform and enforcement of an antidiscriminatory rule of law are important steps toward protecting and fulfilling women's human rights.

Policies and legislation must not discriminate against women when it comes to *access to economically productive assets*. The ability to own and have access to various types of assets must be independent of gender. For example,

For details, see Smith et al. (2003).

Table 26.1 Examples of public policy to improve women's status

Action level	Policies to eradicate discrimination	Policies to proactively promote catch-up in women's status
Basic determinant of nutritional status	<p>Reform legislation to equalize civil, political, economic, social, and cultural rights</p> <ul style="list-style-type: none"> ● voting ● land inheritance and ownership, employment, unemployment, benefits laws ● membership of savings and credit organizations ● mobility to promote social capital 	<p>Monitor efforts to review gender bias in public policy (e.g., South Africa)</p> <p>Target access to new resources to women</p> <ul style="list-style-type: none"> ● credit programs to poor women (e.g., Bangladesh) ● affirmative action programs to actively recruit women in formal employment ● ensure women's equal representation in formal and informal institutions
Underlying determinant of nutritional status	<p>Reform service delivery</p> <ul style="list-style-type: none"> ● equal access to education (quantity and quality) ● equal access to agricultural extension services ● equal access to water and sanitation services, HIV/AIDS prevention programs ● equal immunization rates, availability of and access to reproductive health services, including family-planning information, equal access to preventative and curative health care <p>Introduce legislation to enforce the international code on breast-milk substitutes</p>	<p>Implement cash transfer programs that promote the entry of girls into education and health care systems</p> <ul style="list-style-type: none"> ● food for schooling of young girls (e.g., Bangladesh) ● cash transfers to women in return for health and education behaviors favoring girls (e.g., Mexico) <p>Introduce labor-saving technologies when investing in new water and fuel technology (saves women's time and energy in water and firewood collection)</p>
	<p>Introduce flexible working hours, crèches for working parents, and maternity/paternity benefits paid by state</p>	<p>Subsidies to encourage the promotion of child-care crèches to allow working women to provide their children with good child-care substitutes (e.g., Guatemala City)</p>

the ability to inherit land, to join a credit and savings club, to join a water users' group, to get extension advice, to start up a small enterprise, and to survive in the event of a family breakdown must be equal for women and for men. Strides in the latter area have been successfully made in Canada, where a change in state law regarding the dispensation of income and assets upon divorce improved the likelihood that women will receive a larger share of such resources (see Adam, Hoddinott, and Ligon, Chapter 5).

Social protection programs that minimize the probability of facing risks and mitigate the impacts of shocks are often biased toward males. Folbre's (1995) review of the literature on the United States, Northwest Europe, Latin America and the Caribbean, and Sub-Saharan Africa reveals distinct patterns of gender bias in public policy in this area, particularly for child support and social entitlements, such as pensions. Public regulations often stipulate that maternity benefits and child-care costs are the responsibility of employers, despite the International Labour Organization's Maternity Prevention Convention. Some employers are therefore discouraged from hiring women, and some require a certificate that they are not pregnant. Women are less likely to be employed in formal-sector jobs with benefits such as social security. When women are employed in the formal sector, they pay the same taxes as men, but survivor benefits are much easier for widows of employed men to obtain than for widowers of employed women. Further, retirement benefits are lower for women. Family allowances give benefits to employed men with dependent wives, but not to employed women with dependent children. Moreover, sex discrimination laws, if they exist, may be enforced in the public sector but typically not in the private sector. Such male bias in social protection programs must be eliminated if women are to have any hope of enjoying equal status with men.

At the level of the underlying determinants of child nutrition, men and women, as well as girls and boys, should have equal access to public services, in terms of both quantity and quality. They should have equal access to schools of good quality, reproductive health facilities and information, agricultural advice and agricultural extension, and preventative measures related to HIV/AIDS, such as condoms and education. In the area of food security, women should be unconstrained to grow the kinds of crops on their plots of land that they think are important for the food security and nutrition status of their family. This policy may involve revising formal rules of access and including more women in the design and implementation of outreach programs and the actual delivery of the public services.

Promoting Catch-up in Women's Status

The active promotion of catch-up in women's status is a more controversial proposition. Evidence shows, however, that it should not be—males may get a smaller share of the pie, but the increase in the overall size of the pie more than compensates for this loss.

A first step is to raise the profile of gender issues. One method is to track the different implications of public budgetary allocations for men and women. The Women's Budget Initiative (WBI) is an ambitious and seemingly successful attempt in South Africa (Budlender 1997). Launched in the mid-1990s, the WBI is a collaboration between the parliamentary Joint Standing Committee on Finance and several South African nongovernmental organizations (NGOs). Examples of budget categories analyzed by WBI include education, service provision, public-sector employment, child-care provision, and employment benefits. Even if no immediate action emerges from these activities, they raise consciousness and develop an empirical base for further advocacy. Another way to make gender issues more visible is through national education and advocacy campaigns to raise the value that society places on women and girls. An example of this is Bangladesh's National Girl Child Day on September 30 (Hunger Project 2000).

Beyond these consciousness-raising efforts, actual policies can be redesigned to target females. Here we give four examples of successful attempts to do so, two from Bangladesh and one each from Mexico and Guatemala.

Example: Targeting Credit to Women in Bangladesh

A number of NGOs in Bangladesh have attempted to improve women's status and the well-being of children in their households by directing credit to women. Grameen Bank and Bangladesh Rural Advancement Committee (BRAC) programs have had significant effects on a variety of measures of women's empowerment, including mobility, economic security, control over income and assets, political and legal awareness, and participation in public protests and political campaigning (Hashemi, Schuler, and Riley 1996). Pitt and Khandker's (1998) study on the impacts of three NGO microcredit programs tests for the differential impact of male and female borrowing on eight outcomes: boy's and girl's schooling, women's and men's labor supply, total household expenditure, contraception use, fertility, and value of women's nonland assets. They find that female borrowing had a significant effect on seven out of eight of these. By contrast, male borrowing was

significant in only three out of eight. One of the implications of their results is that household consumption increases by 18 taka for every 100 taka lent to a woman and by 11 taka for every 100 taka lent to a man (Morduch 1999b). Kabeer (1998), using participatory evaluation techniques, finds that despite increased workloads due to receipts of credit, women feel empowered by it. They clearly feel more self-fulfilled and valued by other household members and the community.

Example: Food to Bangladeshi Families to Encourage Girls to Attend School

The Food for Education (FFE) program in Bangladesh is a program designed to address household food insecurity and low female education. The Bangladesh government launched the FFE program in July 1993 on a large-scale pilot basis, covering about 5,000 primary schools throughout the country. Most children from the poorest families in Bangladesh do not attend school because they cannot be spared from contributing to the family's livelihood. The FFE food ration (wheat) becomes the income entitlement enabling a poor family to release children from household obligations so they can go to school. Ahmed (2000b) finds that the program increases attendance for boys and girls, but increases in attendance are about 10–15 percent higher for girls. By equalizing women's and men's human capital, such a program could have far-reaching benefits for the status of women. There is also some evidence that it has led to delayed marriage, with important implications for women's life opportunities (Arends-Kuenning and Amin 1998).

Example: Targeting Cash to Poor Women in Mexico

In August 1997 Mexico initiated a large new countrywide program called *Programa Nacional de Educacion, Salud y Alimentacion* (PROGRESA) to fight "extreme poverty" in the country's rural areas. This multisectoral program provides an integrated package of health, nutrition, and educational services to poor families. With a budget of US\$500 million, the program offers monetary assistance, nutritional supplements, educational grants, and a basic health package to its beneficiaries for at least three consecutive years. One of the innovative aspects of the program is its attempt to transfer the monetary assistance to women. The literature on the differential impacts of male and female income was influential in this aspect of the program's design. An impact evaluation shows that the program has put additional resources under women's control, given women greater control over their movements, educated them on health and nutrition issues, provided new spaces in which to communicate with other woman, educated girls to improve their position

in the future, and increased their self-confidence and self-esteem (Skoufias and McClafferty, Chapter 29; Adato et al., Chapter 30).

Example: Support to Child Day-Care Groups in Guatemala for Poor Working Mothers

The government-sponsored Community Day-Care Program (*Programa de Hogares Comunitarios*, or PHC) in Guatemala, created in 1991, reaches close to 10,000 preschoolers throughout the country (see Ruel et al. 2002, Chapter 31). It is operated as a nontraditional child-care alternative whereby a group of parents select a woman from the neighborhood and designate her as the *madre cuidadora* (care provider). Her task is to receive and care for up to 10 children in her home, 12 hours a day, five days a week. An impact evaluation shows that the overall benefits of the program on children's diet are positive and large. A comparison of beneficiary mothers with a random sample of working mothers from the same area reveals that the program was reaching more vulnerable and at-risk women, particularly single mothers and sole income earners of their family. Because the program provides low-cost, reliable care for extended hours, it appears that vulnerable mothers are relieved from their child-care responsibilities and able to engage in formal employment. Evidence from the evaluation suggests that the government-sponsored day-care program in Guatemala relieves an important constraint to women's labor force participation in urban areas.

What Can Stand-Alone Nutrition Programs do to Promote Catch-up?

It is unreasonable to expect stand-alone nutrition interventions to be able to overcome the effects of long-standing economic, social, and cultural discrimination against women. Nevertheless, there is a growing consensus that nutrition interventions must place a growing emphasis on care to women. The Bangladesh Integrated Nutrition Program (BINP) and the Tamil Nadu Integrated Nutrition Program (TINP) are two examples of large-scale nutrition programs doing just this. The BINP is based on community nutrition promoters, who help mothers identify the causes of malnutrition in their children with a focus on care practices to prevent malnutrition before, during, and after pregnancy. The nutrition promoters work with the women to help them recognize and overcome gender asymmetries such as intrahousehold allocations of food that mean women get served last and least. In addition, Village Women's Groups prepare food for malnourished women,

which is sold to nutrition centers, thus supporting the women's groups, building social capital among women, and strengthening women's decisionmaking through small but important sources of cash. Similarly, the TINP involves women in program implementation, primarily through the support of local women's groups.

There is also a growing consensus that nutrition interventions should focus more on improving the nutritional status of young girls, both for their own benefit and for the benefit of their unborn children (Allen and Gillespie 2001). Balanced protein/energy supplementation may help increase birth weight (de Onis, Villar, and Gulmezoglu 1998). For populations with a high incidence of nutritional anemia, iron and folate supplementation should be routine during antenatal care (Kuiler et al. 1998). Pregnant women in low-calcium areas should be encouraged to increase their consumption of this element through their diet.

The most effective (and cost-effective) way to improve women's status will differ by context. Policymakers must make a number of tactical decisions if there is a conscious policy decision to improve women's status. Is it enough to eliminate discrimination, or is it necessary and feasible to promote active catch-up in women's status? What is the most appropriate level at which to act: basic, underlying, or both? The answers to these questions will depend on the location of the decisionmaker and the political economy of the decisionmaking environment.

There are significant benefits to making the policy decision to improve women's status (Smith et al., Chapter 6). Not only does a woman's own nutritional status improve, but so, too, does the nutritional status of her young children. Improving women's status today is a powerful force for improving the health, longevity, capacity, and productivity of the next generation of young adults.

Microfinance

Manohar Sharma

Among financial institutions serving poor households around the world, microfinance programs have emerged as important players. These programs typically make small loans—sometimes as small as US\$50 to US\$100 and sometimes as large as several thousand dollars—to households lacking access to formal-sector banks (see, for example, Lapenu and Zeller 2001). One important achievement of the microfinance movement has been its relative success in deliberately reaching out to poor women living in diverse socioeconomic environments. More than 90 percent of the clients of the Grameen Bank of Bangladesh, perhaps the most well-known microfinance institution worldwide, are women (Khandker, Khalily, and Khan 1996). Of the nearly 189,587 village bank members worldwide that received loans from the Foundation for International Community Assistance in 2001, most are women (FINCA 2002). The Association for Social Advancement (ASA), another prominent microfinance institution in Bangladesh, has a client base of more than 1.5 million persons, out of which 96 percent are women (ASA 2002). In Malawi 95 percent of loans provided by the Malawi Muzdi Fund go to women borrowers (Diagne and Zeller 2001). The microfinance networks led and catalyzed by Women's World Banking provide direct credit services to more than 12 million poor people around the world. Literally hundreds of similar examples can be found in Africa, Asia, and Latin America.

This is an updated version of Sharma (2001).

The premises behind such targeting are twofold: (1) that microfinance is an effective tool in improving women's status, and (2) that overall household welfare is likely to be higher when microfinance is provided to women rather than men. Women's status, household welfare, and microfinance interact in the following ways:

- A woman's status in a household is linked to how well she can enforce command over available resources. Increased ability to tap financial resources independently enhances her control and, therefore, her influence in household decisionmaking processes.
- Newly financed microenterprises open up an important social platform for women to interact with markets and other social institutions outside the household, enabling them to gain useful knowledge and social capital. Many microfinance programs organize women into groups, not just to reduce transactions costs in credit delivery, but also to assist women in building and making effective use of these opportunities.
- Women's preferences regarding household business management and household consumption goals differ from men's, particularly in societies with severe gender bias. In such situations, placing additional resources in the hands of women is not a mere equalizer: it also materially affects both the quality of investments financed by the microfinance programs and how extra income is spent. IFPRI studies (Quisumbing et al. 1995) have underlined the importance of women's control of resources in achieving better welfare outcomes in food, nutrition, education, and other health statuses of children and their families.
- Women are thought to make better borrowers than men: timely repayment of loans is more likely to take place when women borrow. An IFPRI study in 1997, for example, shows that Bangladeshi groups with a higher proportion of women had significantly better repayment rates (Sharma and Zeller 1997).
- Loans are not simple handouts. If microfinance programs are designed to cover all costs, a potential win-win situation emerges. Development goals related to women's empowerment and improved household welfare are self-financing, and no subsidies are required.

Unfortunately, positive empowerment effects cannot be unconditionally guaranteed. In some male-dominated societies, men may use the agency of the woman to gain access to microfinance funds, diminishing women's role to being mere conduits of cash. Even if women can maintain autonomy in how they gain access to and use microfinance services, their management of newly financed enterprises and shouldering of all attendant risks may alter interhousehold dynamics. Since loans must be repaid even if the project fails,

new activities may increase exposure to financial risks and may impose additional pressures on the already overburdened woman. Finally, in societies following the practice of female seclusion, the new pressures to interact in the marketplace may initially involve a difficult learning period and trigger negative responses. Project failures may lead to serious reprimands and additional negative sanctions against the woman, especially if household resources have to be diverted to repay outstanding debt.

Emerging Evidence

If the arguments presented thus far about the impact of microfinance on women's empowerment are ambiguous, then does empirical evidence resolve the contradictions? While the record on outreach has been impressive, evidence on impact is not yet conclusive. Part of the problem is methodological. First, "empowerment" is not readily observable, so proxy indicators are needed. Empowerment is most strongly manifested in the decisionmaking process; but when outcome variables—such as changes in income and education levels—are used as proxies, not much light is shed on either the decisionmaking dynamics or the mechanism of impact. Second, "empowerment" is a cultural and personal concept; the informant and the researcher may have differing notions of what empowerment means and how it is expressed (see, for example, Kabeer 1998). Third, there is the perennial problem of bias arising out of self-selection in programs (Pitt and Khandker 1998). If microfinance programs tend to attract already-empowered women, ignoring this fact will overestimate the empowerment effect. Similarly, an underestimate of the empowerment effect will result if programs attract or seek out relatively more oppressed women.

Despite these shortcomings, what does the empirical evidence on impact show? Much of the completed research on empowerment effects of microfinance comes from Bangladesh, where the campaign to use microfinance as a vehicle for women's empowerment has been most aggressively pursued. Policymakers must be careful, however, not to generalize findings from Bangladesh to other sociocultural settings.

The most widely cited series of studies on gender-differentiated impacts of microfinance, and one that takes special care to control for selection bias, was based on data collected during 1991–92 from 87 villages in Bangladesh (Pitt and Khandker 1998). The study found that welfare impacts on the household were significantly better when borrowers were women. For every Bangladeshi taka lent to women, the increase in household consumption was

0.18 taka, compared with 0.11 taka when borrowers were men. Only when women borrowed was there a large and important effect on the nutritional status of *both* sons and daughters. Assets other than land also increased substantially when women borrowed—but not when men borrowed. Similarly, it was only when women borrowed that education of girls (rather than just boys) increased. Men, on the other hand, tended to take more leisure as a result of borrowing.

Other studies have attempted to assess impact on empowerment more directly. One widely cited study (Hashemi, Schuler, and Riley 1996) that made special efforts to construct measures of empowerment incorporating client perspectives is based on a 1996 survey of 1,300 married Bangladeshi women members of the leading microfinance institutions, the Grameen Bank and the Bangladesh Rural Advancement Committee (BRAC). The study found that married women participating in these credit programs scored higher than nonparticipating women on a number of empowerment indicators such as involvement in major family decisionmaking, participation in public action, physical mobility, political and legal awareness, and the ability to make small and large purchases. An IFPRI study in Bangladesh similarly indicated significant positive impacts on the physical mobility of women and increased social interactions in the community (Zeller et al. 2001).

Empirical studies point out, however, that positive gender effects cannot always be taken for granted. Many women, lacking skills and confidence, lean on their husbands to make use of their loans. A 1995 study in Bangladesh reported that although 94 percent of the Grameen Bank's borrowers were female, only 37 percent of them were able to exercise control over loan use (Goetz and Sen Gupta 1996). Another survey in Bangladesh in 1998 showed that only 3 percent of the 150 women borrowers surveyed used the money on their own (Khandker 1998). The others gave it to their husbands or other male relatives. In fact, some conclude that women's lack of empowerment is what makes it easier for program managers to enforce loan conditions, therefore making women preferred borrowers. Microfinance institutions tend to downplay this plausible but still unproven conclusion.

Directions for the Future

This short review calls for a positive but cautionary assessment. Microfinance programs targeting women obviously have strong potential to

empower women whose daily lives are constrained by a pitiful lack of command over household and societal resources. Targeting does not mean simply requiring women to sign off on loan papers, since there is no automatic guarantee that this will allow women to retain control over the use of the loan. For the empowerment effect to be significant and lasting, financial products and institutional packages need to be tailored to the specific local preferences and skill bases of women.

Hard-nosed market research is required to identify microenterprises in which women have a strong niche and stand to gain good financial returns. This approach will considerably reduce incentives for powerful male relatives to commandeer the newly available resource for their own benefit. Saving services should provide women the freedom to manage cash flow productively and safely. Women's property rights on the newly financed assets should be clearly established and enforced. The Grameen Bank in Bangladesh, for example, requires homes financed through their loans to be legally registered in the borrower's name.

Finally, the institutions used to draw women into microfinance programs must respond to preexisting social and cultural constraints. In Bangladesh women's credit groups have been particularly successful in strengthening social capital and providing traditionally secluded women a nonintimidating and socially acceptable platform from which to learn and conduct business outside the house. They have also provided a critical launching pad for women to increase and exchange knowledge and assert themselves as visible and important partners in the community. Success in other sociocultural settings will require making equivalent adaptations. Innovations must also focus on reducing the costs of service delivery to maintain the popular support that microfinance has so far received.

Ultimately, women's empowerment requires fundamental changes in society that call for more direct policy instruments. New policies should renegotiate property rights, replace rules sustaining gender inequality, and improve access to and quality of education. Fundamental change on this scale can hardly be worked out easily or quickly, especially in countries where gender bias has been a norm for centuries. Over the short run microfinance programs provide a handy, potentially cost-effective, and politically feasible tool for moving toward gender equality. Group-based activities by women have served as important catalysts of change in Africa and Asia. The scale of change they ultimately catalyze will depend, however, on how seriously other social reforms bearing on women's empowerment are pursued.

Food for Education in Bangladesh

Akhter U. Ahmed and Carlo del Ninno

Pervasive poverty and undernutrition persist in Bangladesh. About half the country's 130 million people cannot afford an adequate diet. Poverty has kept generations of families from sending their children to school, and without education their children's future will be a distressing echo of their own. Furthermore, from birth, children from poor families are often deprived of the basic nutritional building blocks that they need to learn easily. Consequently, the pathway out of poverty is restricted for children from poor families.

Overview of the Food for Education Program

In the country's tradition of creating innovative development programs whose replication is attempted elsewhere, the Government of Bangladesh launched the first-ever Food for Education (FFE) program in 1993 on a large-scale pilot basis. The program was designed to combat the country's poverty and malnutrition by developing long-term human capital.

Many children from poor families in Bangladesh do not attend school mainly because they contribute to their family's livelihood and cannot be spared. The FFE program provides a free monthly ration of foodgrains to poor families if their children attend primary school. Thus, the FFE food-

For details, see Ahmed and del Ninno (2002).

grain ration becomes an income entitlement that enables a child from a poor family to go to school. The family can consume the grain, thus reducing its food budget, or it can sell the grain and use the cash to meet other expenses. FFE provides immediate sustenance for the poor, but perhaps more important, it has the potential to empower future generations by educating today's children. Education would equip children from poor families to improve their productivity, thereby expanding their future income-earning opportunities.

By 2000 the FFE program covered about 27 percent of all primary schools in Bangladesh. Out of 5.2 million students enrolled in schools with FFE, about 40 percent receive foodgrains (mostly wheat) through the program. About 2 million families benefit from the FFE program. Households with primary-school-age children become eligible for FFE rations if they meet at least one of four targeting criteria. To maintain their eligibility, children must attend 85 percent of classes each month. The program costs US\$0.10 per student per day, totaling US\$77 million in 2000.

Purpose of the Study

This study describes the main features of the FFE program and evaluates its performance in fulfilling its official objectives of increasing school enrollment, promoting school attendance, preventing dropouts, and improving educational quality.

This study also examines the targeting effectiveness of the program, its impact on food consumption and nutrition, and the efficiency of the food-grain distribution system. After evaluating program performance, the study presents conclusions for policy.

Data, Evaluation Results, and Policy Conclusions

In September and October 2000 IFPRI collected primary data from multiple surveys covering primary schools with and without the FFE program, households including program beneficiaries and nonbeneficiaries, communities, and foodgrain dealers. In addition to the surveys, academic achievement tests, designed to assess the quality of education received by students, were given to students enrolled in both FFE and non-FFE schools. Based on these data, IFPRI researchers used a variety of quantitative and qualitative methods to evaluate the FFE program.

Educational Effectiveness

The school survey results suggest that FFE has been successful in increasing primary school enrollment, promoting school attendance, and reducing dropout rates (Table 28.1). Student enrollment in FFE schools increased by 35 percent per school during the two-year period from the year before the start of the FFE program to the year after the introduction of the program. Enrollment of girls increased by a remarkable 44 percent. For boys the increase was 28 percent. In contrast, enrollment in non-FFE schools increased by only 2.5 percent per school during the period.

Since the inception of the program in 1993, the number of teachers per school has remained virtually constant in all schools, whereas student enrollment has increased significantly in FFE schools. As a result, there are more students per teacher in FFE schools than in non-FFE schools. Moreover,

Table 28.1 Change in enrollment rate per school, by type of school (percent change)

Information	FFE schools			Non-FFE schools		
	Government	Non-		Government	Non-	
		government	All		government	All
Before FFE to after FFE (over a two-year period) ^a						
All students	33.7	43.0	35.2	2.5	n/a	n/a
Boys	27.1	32.9	28.1	0.1	n/a	n/a
Girls	41.3	55.3	43.6	5.4	n/a	n/a
1997 to 1998						
All students	2.0	1.7	2.0	1.2	0.4	0.8
Boys	2.0	1.2	1.6	1.4	0.0	0.7
Girls	2.1	2.3	2.3	1.0	0.9	1.0
1998 to 1999						
All students	1.6	2.7	2.2	1.7	1.1	1.3
Boys	1.0	2.5	1.8	1.3	1.1	1.2
Girls	2.2	2.8	2.6	2.1	1.0	1.6
1999 to 2000						
All students	2.6	2.2	2.4	1.5	1.0	1.2
Boys	3.5	2.7	3.1	1.2	1.0	1.1
Girls	1.7	1.6	1.7	1.8	0.9	1.3

Source: Based on data from IFPRI's "Food for Education Evaluation Survey, 2000: School Survey," Bangladesh.

Note: n/a indicates information was not available.

^aFor non-FFE schools, the percentage change in enrollment per school is calculated at the national level from 1992 (the year before FFE) to 1994 (the year after FFE).

because of increased enrollment and class attendance rates, FFE school classrooms are more crowded than non-FFE school classrooms. Consequently, there have been concerns that relatively crowded classrooms in FFE schools have caused the quality of education to deteriorate.

The student academic achievement test scores, on average, are lower in FFE schools than in non-FFE schools. Further analyses reveal, however, that within FFE schools the average test score of FFE beneficiary students is less than that of nonbeneficiary students, and this gap brings down the aggregate score in FFE schools. In fact, the nonbeneficiary students in FFE schools scored about the same as students in non-FFE schools on the average, despite a significantly larger class size in FFE schools. Hence, caution is necessary in drawing conclusions about the impact of the FFE program on achievement test scores. Follow-up research will concentrate further on this important issue.

Moreover, students in government schools performed better in the achievement test than students in nongovernment schools, and this difference holds true for both FFE and non-FFE schools. Government primary schools have better facilities, more-qualified teachers, and better incentives for teachers compared with nongovernment primary schools. The quality of primary education is thus directly related to the physical facilities and quality of teachers in primary schools. To improve the quality of education in FFE schools in general and in nongovernment FFE schools in particular, the program would need complementary financial assistance to improve school facilities, hire better-qualified teachers, and provide training as well as adequate monetary incentives to teachers.

The Effectiveness of Targeting Households and Communities

The household-level analysis suggests that in general, FFE effectively targets low-income households. Considerable scope exists, however, for improving targeting because a sizable number of poor households remain excluded from the program while many nonpoor households are included. A more accurate yet low-cost means-testing method, such as the indicator-based proxy means tests to predict household income and welfare, needs to be considered to improve targeting.

The village census findings show that there is considerable scope for increasing primary school enrollment through geographic targeting of the FFE program at the *thana* level.¹ Given the large regional disparity in the

*A *thana* is an administrative unit consisting of 80 to 90 villages.

rates of enrollment and literacy across *thanas*, it is clear that FFE could have a much larger impact on enrollment if larger shares of program resources were targeted to areas with relatively lower enrollment rates.

The Effectiveness of the Foodgrain Distribution System

Recently, the FFE foodgrain distribution system began distributing food through private dealers rather than through school management committees, as was previously done. This evaluation finds that this dealer-based system is far from satisfactory. Individual FFE beneficiaries have difficulty claiming their free and full ration from powerful and profit-minded private dealers, and they experience losses in their foodgrain entitlement owing to dealer malpractice. Also, beneficiaries spend a great deal of time and money on traveling to dealers' distribution centers to collect rations.

Past studies on the public food distribution system in Bangladesh conclude that ration channels that depend on private traders to deliver subsidized food to the poor invariably suffer from heavy leakage (Ahmed 1992, 2000a; Haggblade, Rahman, and Rashid 1993). The private-sector profit motive is valuable when it stimulates competitive cost-cutting and efficient delivery of services. It is a disadvantage, however, when it motivates diversion of subsidized or free foods away from intended beneficiaries.

The FFE program can lower leakage by modifying the distribution system that the program used before switching to the current dealer-based system. In the modified system, schoolteachers would not be directly involved in foodgrain distribution. Instead, either a local nongovernmental organization (NGO), a youth club, or even a private dealer would deliver foodgrains to the beneficiaries on the school premises on a set day each month. This system would empower beneficiaries by establishing a sense of group solidarity among recipients, assisting them in clarifying the amounts of rations to which they are entitled, and facilitating collective action against pilferage. This system would reduce inconvenience and transaction costs to beneficiaries in collecting their FFE rations.

Recommendations for Follow-up

Future research on FFE could focus on program extensions aimed at improving the cognitive abilities of children. Researchers could explore two specific issues in this regard—combining FFE with school feeding, and expanding the program to preschool children. Experiences in other countries have shown that undernutrition reduces a child's ability to concentrate and retain what has been learned (Pollitt 1990). School feeding, especially a light snack

early in the day, has been shown to improve performance in case studies from outside Bangladesh (Grosh 1992). Furthermore, a preschool feeding program (such as the National Nutrition Project in Bangladesh) could become a key intervention for improving the cognitive abilities of children. Better-nourished preschool children will be better learners in primary school and beyond.

Is PROGRESA Working? Summary of the Results of an Evaluation by IFPRI

Emmanuel Skoufias and Bonnie McClafferty

Mexico's *Programa Nacional de Educación, Salud y Alimentación* (PROGRESA) is a major government program aimed at developing the human capital of poor households. Targeting its benefits directly to the population in extreme poverty in rural areas, it seeks to alleviate current poverty through monetary and in-kind benefits, as well as to reduce future levels of poverty by encouraging investments in education, health, and nutrition. This chapter (based on Skoufias and McClafferty 2001) summarizes 24 months of extensive IFPRI research designed to evaluate whether PROGRESA has been successful in achieving its goals. The evaluation analyzed PROGRESA's impact on education, health, and nutrition as well as in other areas, such as women's status and work incentives (see Adato et al., Chapter 30).

Program Overview

PROGRESA began operations in August 1997. As part of an overall strategy for poverty alleviation in Mexico, PROGRESA works in conjunction with other programs that are aimed at developing employment and income opportunities. At the end of 1999, PROGRESA accounted for slightly less than 20 percent of the federal government's budget allocated to poverty alleviation. Unlike other programs, PROGRESA's multisectoral focus provides an

For details, see Skoufias and McClafferty (2001) and Skoufias (2001).

integrated package of education, nutrition, and health services to poor families. Rather than being simply a cash transfer program, PROGRESA requires active participation by the recipient households in exchange for the benefits.

At the end of 1999, PROGRESA covered approximately 2.6 million families or about 40 percent of all rural families and one-ninth of all families in Mexico. At that time the program operated in almost 50,000 localities in more than 2,000 municipalities and 31 states. PROGRESA's budget of approximately \$777 million in 1999 was equivalent to 0.2 percent of Mexico's gross domestic product (GDP). Mexico is implementing an effective program that is serving as a model and beginning to take hold across Latin America in countries such as Argentina, Honduras, and Nicaragua.

To reach the poor households, PROGRESA first selects communities using a marginality index based on census data. Then, within the selected marginal communities, households are chosen using socioeconomic data collected for all households in the community. The education component of PROGRESA is designed to increase school enrollment by making education grants available to pupils' mothers, who then are required to have their children attend school regularly. In localities where PROGRESA currently operates, households that have been characterized as poor and have children enrolled in grades three through nine are eligible to receive these education grants every two months. The levels of these grants were determined taking into account, among other factors, what a child would earn in the labor force or contribute to family production. The education grants are slightly higher at the secondary level for girls, given their propensity to drop out at earlier ages.

In the area of health and nutrition, PROGRESA brings basic attention to health issues and promotes health care through free preventive interventions, such as nutritional supplements and education on hygiene and nutrition, as well as monetary transfers for the purchase of food. Receipt of monetary transfers and nutritional supplements are tied to mandatory health care visits to public clinics. This aspect of the program targets its benefits to children under five and pregnant and lactating women. It is administered by the Ministry of Health and by IMSS-Solidaridad, a branch of the Mexican Social Security Institute, which provides benefits to uninsured individuals in rural areas.

Nutritional supplements are given to children ages four months to two years and to pregnant and breast-feeding women. If signs of malnutrition are detected in children ages two to five, nutritional supplements are also administered. The nutritional status of beneficiaries is monitored by mandatory visits to the clinic and is more frequently monitored for children five years

and under and pregnant and lactating women. Upon each visit, younger children and lactating women are measured for wasting (weight-for-height), stunting (height-for-age), and weight-for-age. An appointment monitoring system is set up, and a nurse or doctor verifies adherence. Every two months health care professionals submit certification of beneficiary visits to PROGRESA, and this certification triggers the receipt of bimonthly food support.

PROGRESA is primarily a demand-side program. Its main objective is to induce households (through cash transfers and conditions associated with the receipt of these cash transfers) to make more intensive use of the existing educational and health facilities. The program is accompanied by complementary efforts and resources directed at strengthening the supply and quality of the educational and health services, but these efforts serve only an auxiliary role as a means of easing potential capacity constraints that might arise as a result of the more intensive use of the existing facilities.

PROGRESA gives benefits exclusively to mothers. The concentration and value of this transfer in the hands of the mother and the enormous scale of the program suggest that this program has significant potential to alter the balance of power within Mexican families.

How the Evaluation was Conducted

The strength of the PROGRESA evaluation lies in its methods. Three key factors contribute to its rigor: (1) the quasi-experimental design used for the evaluation, (2) the collection of repeated observations of households and their members before and after the program, and (3) the analytical approaches used in determining whether PROGRESA has had an impact.

For a proper impact evaluation of a program, it is necessary to observe a group of households that are similar to beneficiary households in every respect possible but that do not benefit from the program. In the case of PROGRESA, where evaluation was conceived from the beginning as part of the design of the program, the solution to this evaluation problem is achieved by random assignment of localities into treatment and control groups. Annual fiscal constraints and logistical complexities associated with the operation of PROGRESA in very small and remote rural communities did not permit the program to cover all eligible localities at once. Instead, localities are covered by the program in phases. PROGRESA's quasi-experimental design takes advantage of sequential expansion to select a comparable or control group from the set of localities that, while eligible for the program, have yet to be covered by it. This practice offers the opportunity to conduct a sci-

entifically rigorous evaluation of whether the program has had an impact, and if so, the size of this impact on beneficiary households.¹

The quasi-experimental design of the evaluation, combined with the availability of repeated observations on households and their members before and after the program, can provide the most reliable answer to the question of whether the program has an impact or not. By examining changes over time within treatment and control localities (that is, comparing difference-in-difference), evaluators can control for characteristics that do not change over time within treatment and control localities, as well as for characteristics that change over time and are common to control and treatment areas.

To evaluate impact, researchers conducted formal surveys, structured and semistructured observations and interviews, focus groups, and workshops with a series of stakeholders, including beneficiaries, local leaders, local and central PROGRESA officials, health clinic doctors, nurses, and assistants, and schoolteachers.

The sample used in the evaluation of PROGRESA consists of repeated observations (panel data) collected for 24,000 households from 506 localities in the seven states of Guerrero, Hidalgo, Michoacan, Puebla, Queretaro, San Luis Potosi, and Veracruz. Of the 506 localities, 320 localities were assigned to the treatment group and 186 localities were assigned as controls. Specifically, the 320 treatment localities were randomly selected using probabilities proportional to size from a universe of 4,546 localities that were covered by phase II of the program in the seven states mentioned.² Using the same method, the 186 control localities were selected from a universe of 1,850 localities in these seven states that were to be covered by PROGRESA

¹An analysis of the randomization procedure used in the evaluation (Behrman and Todd 1999) reveals that the randomization was adequately done. PROGRESA's approach ensures that there is only a small known probability that the differences between treatment and control groups are due to unobserved factors. Thus, researchers were able to infer whether the changes observed in individual outcomes, such as school enrollment or health and nutritional status, were due to the program or other factors.

²In addition to the seven states mentioned, the second phase of PROGRESA's expansion included the states of Campeche, Coahuila, Chiapas, Chihuahua, Guanajuato, and Oaxaca. The evaluation sample did not include localities from these six states for a variety of reasons. For example, the sociopolitical problems in the state of Chiapas led to exclusion of this state from sample group. Although the two poorest states of Chiapas and Oaxaca were excluded from the pool of seven states used to select the evaluation sample, this exclusion does not affect the results of the evaluation. The evaluation might be compromised if Chiapas and Oaxaca had been included in the pool of seven states but excluded from the evaluation sample after performing the "random selection." Because neither state was included in the evaluation sample, however, the estimated impact cannot be said to hold in Chiapas or Oaxaca or in any locality outside the evaluation sample.

in later phases. The data used in the evaluation were collected between November 1997 and November 1999. As originally planned, the localities serving the role of a control group started receiving PROGRESA benefits by December 2000.

Findings on PROGRESA's Education and Health Benefits and Costs

The majority of the evaluation findings suggest that PROGRESA's combination of education, health, and nutrition interventions into one integrated package has a significant impact on the welfare and human capital of poor rural families in Mexico. The initial analysis of PROGRESA's impact on education shows that the program has significantly increased the enrollment of boys and girls, particularly of girls and particularly at the secondary school level.

Most of the increase in school enrollment for boys takes place as a result of boys' working less. The evaluation finds that enrollment of girls in secondary school increases by as much as 14 percent. The results imply that children will have, on average, about 0.7 years of extra schooling because of PROGRESA, although this effect may increase if children are more likely to go on to senior high school as a result of PROGRESA. Given that higher schooling is associated with higher levels of income, the estimations imply that the lifetime earnings of PROGRESA children could be 8 percent higher than they otherwise would have been thanks to the education benefits they have received through PROGRESA (Schultz 2000).

As a result of PROGRESA, both children and adults are also experiencing improvements in health (Gertler 2000). Specifically, children receiving PROGRESA's benefits have a 12 percent lower incidence of illness as a result of the program's benefits, and adults report a 19 percent decrease in sick or disability days. In the area of nutrition, PROGRESA has had a significant effect on reducing the probability of stunting for children aged 12 to 36 months (Behrman and Hoddinott 2000).

PROGRESA has also had important effects on food consumption (Hoddinott, Skoufias, and Washburn 2000). Program beneficiaries report higher calorie consumption and more diverse diets, including more fruits, vegetables, and meat. The program is also found to have no apparent effects on the work incentives of adults, while the award of the cash benefits to mothers in beneficiary households appears to have led to the empowerment of women.

A detailed cost analysis of the program also provides strong evidence that the program is generally administered in a cost-effective manner (Coady 2000). For every 100 pesos allocated to the program, 8.9 pesos are “absorbed” by administration costs. Given the complexity of the program, this level of program costs appears to be quite small, especially when compared with the numbers for roughly comparable programs.

Discussion and Recommendations

The findings from IFPRI’s evaluation also suggest that there is considerable room for improvement in some of the structural components and the operation of the program. For example, the program was found to have no measurable impact on the achievement test scores of children in beneficiary localities or on their regular school attendance. This finding suggests that if the program is to have a significant effect on the human capital of children, more attention needs to be directed to the quality of education provided in schools.

Enrolling in and attending school regularly are necessary but not sufficient conditions for the improvement of children’s human capital. Currently the award of PROGRESA’s educational benefits is conditional on regular school attendance but not performance. It may be possible to attain considerable improvements by linking benefits to performance, such as granting bonuses to encourage successful completion of a grade, or linking benefits with other programs.

It is also important to find ways to maintain and improve the quality of the information provided to beneficiaries. Although the targeting of households within poor marginal communities may be a source of more social tensions than social benefits, there is no doubt that if PROGRESA were to expand in urban areas, some form of targeting must take place. Better alternatives to the current reliance of PROGRESA on reported income include the use of household consumption as a measure of poverty.

Whether the vicious circle of intergenerational poverty is indeed broken can be determined only by continuing with PROGRESA and continuing to evaluate its impact on the livelihood of Mexico’s poor in the medium and long term. The possibility of expanding PROGRESA coverage to poor households in urban areas implies that there is an opportunity to draw on the results of program evaluation to adapt some of the components of the program to suit the needs of households in different environments. Mexico’s policy leaders are encouraged to capitalize on the innovative precedent established by PROGRESA and to consider program evaluation an indispensable component of all social policies.

The Impact of PROGRESA on Women's Status and Intrahousehold Relations

Michelle Adato, Bénédicte de la Brière,
Dubravka Mindek, and Agnes R. Quisumbing

Since 1997 Mexico has provided poor families with cash benefits linked to children's school attendance and regular clinic attendance, as well as in-kind health benefits and nutritional supplements, through the *Programa Nacional de Educación, Salud y Alimentación* (PROGRESA). Unlike previous social programs in Mexico, this nationwide antipoverty program targets transfers to the mother of the family. Planners deliberately decided to give transfers directly to the mother because of the growing literature that finds that resources controlled by women are more likely to be manifested in greater improvements in child health and nutrition than resources controlled by men.

Program staff argue that the design of the program may also empower women by increasing their control over resources and thus their bargaining power.

The size of the amount transferred by the program, corresponding to a 22 percent increase in the income levels of the beneficiary family, the concentration of this transfer in the hands of the mother, and the enormous scale of the program suggest that the program has great potential to alter the balance of power within Mexican families. This study examines how the program has affected women's status and intrahousehold relations. We use both quantitative and qualitative methods to analyze this issue. The quantitative analysis

For details, see Adato et al. (2000).

seeks to ascertain whether or not the implementation of PROGRESA contributed to an increase in women's bargaining power, controlling for family background variables, the distribution of bargaining power within the household before the program, and variables capturing the family's eligibility for PROGRESA, location in control or program communities, and transfers disbursed by the program. The qualitative analysis aims to gain a deeper understanding of selected issues related to women's empowerment. In the qualitative part of the study, women explain in their own words how they and others in their communities experience PROGRESA, and they suggest ways to improve the program to contribute further to women's empowerment and to better respond to their concerns and aspirations.

Quantitative Study

Owing to the randomized design of the evaluation surveys, one way of evaluating the impact of PROGRESA would be to compare the means of PROGRESA beneficiaries with those of eligible households in control communities before and after the implementation of the program. Additional insights can be gained, however, by also controlling for individual and family characteristics, particularly characteristics that may affect each spouse's bargaining power. Following recent work in the intrahousehold literature, this study uses characteristics of the husband and wife at the time of their marriage as a measure of each spouse's bargaining power.

Multinomial logit regressions were performed with responses to questions regarding who should make certain decisions within the household as the dependent variable, with the following choices: husband alone, wife alone, or both spouses jointly. These decisions were the following: seeking medical attention for the child, telling the child to attend school, giving the child permission to go out, expenditures on child clothing, food expenditures, house repairs, durables purchases, and the disposition of women's extra income.

Our results show that characteristics of husband and wife are the most consistent determinants of decisionmaking patterns. The husband is more likely to be the sole decisionmaker if his wife is less educated, has less work experience before marriage, does not speak Spanish, or speaks an indigenous language. Husbands who speak an indigenous language are also more likely to be the single decisionmaker, suggesting that women's roles may be more traditional in indigenous societies.

Among poor households, residing in a PROGRESA locality does not have as predictable or strong an effect on patterns of decisionmaking as individual characteristics do. Transfer amounts, however, decrease the incidence of husbands' sole decisionmaking for five out of eight outcomes.

One of the most noteworthy outcomes is the effect of PROGRESA transfers on poor households' decisions regarding the disposition of women's extra income. PROGRESA transfers have a small but significant negative effect on the probability that the woman lets her husband decide how to spend her additional income. The probability that women decide on the use of their own income also increases through time, but this occurs in both PROGRESA and non-PROGRESA communities. We also find that spillover effects of PROGRESA on the decisionmaking patterns of nonpoor households living in PROGRESA communities are negligible.

Qualitative Study

The qualitative research, conducted in six states, was based on 23 focus groups involving 230 women: 80 beneficiaries, 80 nonbeneficiaries, and *promotoras* (community mobilizers) from 70 communities.

The results show that women strongly support the principle of designating women as beneficiaries. The main reasons given were that women are more responsible with money and thus more will be spent on the family and that women are more concerned with the welfare of their children. In a majority of responses, women mentioned that men are likely to spend money they receive on alcohol. An additional reason given was that PROGRESA is for household needs such as food, and women know best what the household needs.

Most men accept women's role in the program because the benefits help the husband, too, and the family as a whole. They allow their wives to spend the time necessary to fulfill their PROGRESA requirements because the benefits they receive compensate. Some men, however, are unhappy with the time that women spend out of the house for their PROGRESA responsibilities. Women say they minimize conflict by making sure that their household responsibilities are taken care of before leaving the house. Including men in initial PROGRESA general meetings where beneficiary responsibilities and program activities are explained has been helpful in increasing men's acceptance of the program.

The focus group discussions also focused on expenditure decisions. Both beneficiaries and nonbeneficiaries said that women made decisions on their

own about food expenditures, whereas men alone or couples jointly decided about larger household expenditures. Participation in PROGRESA does not appear from these discussions to notably alter the domains of decisionmaking. There are four ways, however, in which respondents suggest that PROGRESA can increase women's autonomy with respect to household expenditure decisions: (1) she does not need to ask her husband for money whenever she needs something; she can purchase it independently with money from PROGRESA; (2) because she receives this additional household income, she has more confidence in her ability to determine whether there is enough money to buy things she thinks they need, whereas when her husband held the money, he was in a better position to judge; (3) if with PROGRESA there is more money available for the family to spend on food, which is part of her domain, women can now make more decisions about such expenditures even if the types of decisions have not changed; and (4) PROGRESA money may potentially increase the domain of women's decisionmaking in some instances.

Although PROGRESA's mode of assistance centers on the individual beneficiary and does not involve local organizations, the program does involve activities where women gather in groups and have the opportunity to communicate with each other. Monthly meetings with *promotoras* are officially for giving program-related information to beneficiaries, but in some communities they also provide a space for women to talk about other concerns and problems. At health *pláticas* health issues of importance to women are discussed. In addition, *faenas* are communal work activities that do not officially have an association with PROGRESA, but they are organized by doctors or *promotoras* and often involve beneficiaries. These collective activities, as well as the trips the women make to pick up their cash transfers, are also opportunities for them to leave their homes and their communities without their spouses.

Promotoras and beneficiaries described personal changes that are forms of empowerment, including increased freedom of movement, self-confidence, and "opening their minds." The type of changes reported fall into three categories: (1) women leave the house more often; (2) women have the opportunity to speak to each other about concerns, problems, and solutions; and (3) women are more comfortable speaking out in groups. Such changes were more pronounced for *promotoras* than beneficiaries, though some beneficiaries had similar experiences. Some beneficiaries reported no such changes, however. These reported changes suggest ways in which PROGRESA can potentially contribute to longer-term social development, even if in small ways, and thus the importance of these collective activities.

Another way in which PROGRESA contributes to women's empowerment is through the content of what they learn in the health *pláticas*. Beneficiaries refer in general to "knowing more" now and to a wide range of new knowledge in the areas of sanitation, nutrition, illnesses, and other health-related issues. They also report changes that have occurred in women's relationships with men as a result of what they have learned, for example, in the area of family planning.

The research thus suggests that women are benefiting from a new recognition of their importance in the family, new freedom of movement, and some increased confidence, awareness, and knowledge, without paying a major price in terms of intrahousehold harmony. Nevertheless, the changes in intrahousehold relations brought about by the program appear to be modest. This finding should not come as a surprise or disappointment. Change in this domain is necessarily slow as well as complex, as women make strategic choices involving challenge, conformity, and accommodation. PROGRESA gives women new resources and information with which to approach these choices.

General Conclusions

If material poverty and poor health and nutrition are obstacles to the empowerment of women, then overcoming these obstacles is the main way in which PROGRESA contributes to women's empowerment. The program contributes in other ways as well, by putting additional resources under women's control, giving women more opportunities to leave the house, educating them on health and nutrition issues, providing new spaces in which to communicate with other women, and educating girls to improve their position in the future. These aspects of the program appear to have had some impacts on personal empowerment (for example, self-esteem, "sense of self in a wider context") though more modest impacts on intrahousehold relationships. More generally, the program is introduced with messages about women's importance, and beneficiary and nonbeneficiary families notice the government recognition that PROGRESA's design gives to women. This approach has fostered, if at a low level, a discourse within PROGRESA communities around gender issues.

PROGRESA could strengthen its impact on women's empowerment. In addition to its health and child education strategies, PROGRESA policy originally envisioned a number of other program features that represented a more holistic and developmental approach to poverty reduction. Revisiting

some of these ideas (for example, adult education, productive projects, community participation), as well as learning from women's suggestions (such as health education for men) or from ways in which the program has been adapted in communities with good results (for example, encouraging *promotoras* to use the monthly meetings as a forum for women to discuss problems and solutions), would strengthen the program's short-term benefits and its long-term potential to reduce poverty and promote development.

Subsidized Childcare and Working Women in Urban Guatemala

Marie T. Ruel, Bénédicte de la Brière, Kelly Hallman,
Agnes R. Quisumbing, and Nora Coj de Salazar

With increasing urbanization, the percentage of women participating in the labor force and the percentage of households headed by single mothers have increased. Reliable and affordable child-care alternatives are thus becoming increasingly important in urban areas. The *Hogares Comunitarios* Program (HCP) was established in Guatemala City in 1991 as a direct response to the increasing need of poor urban dwellers for substitute childcare. This government-sponsored pilot program was designed as a strategy to alleviate poverty by providing working parents with low-cost, high-quality childcare within their community.

This chapter summarizes preliminary findings from an evaluation of the HCP carried out in 1998 in urban slums of Guatemala City (Ruel et al. 2002). The study evaluated both the program's operations (or process) and its impact on children's dietary intakes and women's earnings.

Program Background

The model of the HCP is that a group of parents elects a woman from their neighborhood to act as the caretaker mother, which implies that she will care

For details, see Ruel et al. (2002) and Hallman et al. (2003).

for up to 10 children in her home, 12 hours a day, 5 days a week. During their stay in the *hogar* (day-care center), the children receive care and affection, hygiene, early child stimulation, and food (two meals and two snacks). The program provides initial training for the caretaker mothers, as well as furniture, cooking equipment, and supplies for 10 children. On a monthly basis the program gives approximately US\$1 per child per day to the caretaker for purchasing food, gas, and educational material. The program also gives the caretaker an incentive of US\$3 a month for each child who attends, which is complemented by a US\$5 per child monthly contribution from the parents.

Operational Evaluation

The operational evaluation had three objectives: (1) to review and evaluate the effectiveness of implementation of the program; (2) to assess the quality of the services provided by the caretakers; and (3) to evaluate the level of satisfaction and the attitudes of the program's main implementers (caretakers and their supervisors) and main users (the beneficiary parents). We used both qualitative and quantitative methods, including semi-structured interviews with caretaker mothers, eight-hour observations in the *hogares*, and focus groups with caretakers, beneficiary parents, and program field supervisors. The evaluation was carried out in 206 *hogares* operating in three zones of Guatemala City.

Findings show that the program is generally well designed and is operating effectively. Delays in cash transfers for food, the insufficient amount of the transfer, and the lack of participation of parents were the key operational constraints identified. The quality of services provided by the caretakers with respect to hygiene, safety, and their interaction with children was good overall, but it varied significantly between *hogares*. Caretakers consistently failed to allocate the required amount of time to educational activities, largely because of time constraints, but also because they did not feel adequately trained, motivated, and remunerated. Caretakers were generally grateful to the program for the opportunity to work while taking care of their own children (or grandchildren). Beneficiary parents were extremely positive about the program. They appreciated the caretakers and the program for the assistance received and reported that the program was affordable. They suggested the addition of Saturday care and an increased emphasis on preventive and curative health.

When a new central government administration who took over the program in 2000, it included in the new four-year plan concrete actions to address many of the constraints identified by our evaluation. These actions included increasing the amount of the cash transfers, strengthening preventive and curative health services, hiring educators to ease the time constraints of caretaker mothers, and strengthening human resources through additional training.

Impact Evaluation

The impact evaluation was carried out in one zone of Guatemala City and included (1) a case-control design of approximately 250 beneficiary children matched with control children of the same age and neighborhood and whose mothers also worked outside the home; and (2) a random sample of approximately 1,400 households with children zero to seven years of age. The main objective was to assess the impact of the program on children's dietary intakes, on maternal wages and employment conditions, on household expenditure patterns, and on older siblings' school attendance. Only preliminary findings of the impact of the program on children's dietary intakes are presented here. The purpose of the random sample was to examine aspects of targeting, coverage, patterns of use of other types of childcare, and their cost and to control for self-selection biases (of mothers into the labor force and into the program).

Beneficiary mothers tended to be slightly less educated, have fewer assets, and live in lower-quality housing than mothers from the random sample (working or nonworking). Beneficiary mothers were also much more likely to be single: 40 percent of beneficiary mothers were single compared with 29 percent among working mothers from the random sample and 17 percent among mothers from the random sample as a whole. Beneficiary mothers had smaller household size but a higher mean number of preschoolers and thus a higher dependency ratio than women from the random sample.

Children of beneficiary mothers were more likely to be stunted and had lower height-for-age Z-scores than children from the random sample. Since stunting is a cumulative indicator of long-term growth retardation, it is likely that these children had suffered chronic growth retardation throughout their young childhood (and possibly starting from life in *utero*) as a result of a combination of factors, including poverty, food insecurity, poor health, and poor maternal care.

Beneficiary mothers, on the other hand, were more likely to be employed in the formal sector and to work in factories than other working mothers and to receive work-related social and medical benefits. The income of beneficiary mothers in the previous month was also 30 percent higher than the income of working mothers from the random sample.

Thus, the program appears to be reaching its targeted population: poor families with working parents, and especially single mothers with child-care responsibilities. It is likely that the program, because it provides reliable and affordable childcare for 12 hours a day, allows single mothers to engage in more formal, and possibly more stable, employment, which also offers them a higher wage and more social and medical benefits. The low coverage of the program (only 3 percent of working mothers in the random sample used the program) seems to result from lack of supply rather than low demand.

Among nonbeneficiary families, the most commonly used child-care arrangements involved household members and extended family members. Even compared with these informal alternatives, the HCP was one of the lowest-cost alternatives, ranking second, after resident household members. Nonresident relatives were more costly than the HCP, as were neighbors, other private arrangements, and formal childcare.

Impact on Children's Diet

The program is having a significant and positive impact on children's nutrient intake and dietary diversity: children participating in the program consume, on average, 20 percent more energy, proteins, and iron and 50 percent more vitamin A than control children. Moreover, a greater proportion of the key micronutrients (iron and vitamin A) consumed by beneficiary children came from animal products and thus is in a more bioavailable form (more easily absorbed and used by the body). Because the home diet of beneficiary children was also slightly more nutritious compared with control children, the net nutritional impact of the program is positive and significant.

Impact on Women's Labor Force Participation and Earnings

The low percentage of working mothers participating in the program made it impossible to evaluate the impact of the program itself on labor force participation and earnings. Using the random sample data, however, we

evaluated the impact of child-care availability—in terms of both prices and travel time—on the choice between formal and informal care, taking into account a woman’s joint decision to work and to choose the type of childcare. In Guatemala City women’s decision to work was significantly affected by their age and the demographic characteristics of their household—particularly the availability of substitute caregivers. Women were also less likely to work if they had children below three years of age. Although education did not affect women’s decision to work, it was significantly associated with greater use of formal day care. Use of formal care was also greater among women who had children three to seven years of age. Although the price of day care (either formal or informal) was not associated with the choice of day-care alternatives, longer median travel time between home and formal day care was negatively associated with its use.

After controlling for selection into the labor force, we found that women’s education was the most important factor affecting their wages, hours worked, and total earnings. Education increased women’s hourly wages and total earnings but decreased their hours worked, possibly through a wealth effect. Controlling for endogeneity of labor market participation and formal day-care use, the price of formal day care had negative but insignificant impacts on mothers’ earnings. This suggests that interventions to increase the availability and lower the time costs of formal day care in poor urban areas have the potential to raise labor force participation rates of mothers residing in such neighborhoods, but not necessarily their earnings conditional upon their having entered the labor force.

Conclusions

The government-sponsored HCP in Guatemala provides affordable and good-quality childcare for extended hours, thereby providing needed support to vulnerable urban households, namely single mothers. The program relieves one of the key constraints to women’s labor force participation in urban areas, while at the same time improving children’s nutrition. Thus, expansion and continued strengthening of this type of program could significantly contribute to reducing urban poverty, food insecurity, and childhood malnutrition.

Modeling the Effects of Trade on Women: The Case of Zambia

Marzia Fontana

Despite substantial economic liberalization since the early 1990s, non-traditional exports in Zambia have grown only moderately and agricultural performance overall has been disappointing. Though agriculture accounts for less than 20 percent of gross domestic product (GDP), it is the most important source of employment, especially for women. Interpretations of Zambia's poor performance variously emphasize external factors, such as declining copper prices and vulnerability to weather shocks, and market imperfections. Several authors also point to the importance of women in agriculture and explain the very low supply response by the constraints that women face, in terms of both limited access to assets and burden of work within households (Blackden and Selim 1993; Wold 1997).

This chapter aims to see what insights can be gained into the gender effects of trade in Zambia by using a disaggregated social accounting matrix (SAM) and computable general equilibrium (CGE) model,¹ which have been modified to include details on the gender composition of the labor market, household work, and leisure. The gendered Zambia SAM described in this paper has 12 market sectors, differentiates workers by both gender and education (a total of eight labor types), and accounts for land as well as

For details, see Fontana (2002).

¹A SAM summarizes input-output (production) relationships among different sectors and assigns income flows from ownership of factors of production to different types of households in the economy. A CGE model is a system of equations that brings a SAM to life by simulating the working of a market economy. The prices and quantities of all the goods and factors are determined simultaneously in every market by the need to equate supply and demand.

for capital. It distinguishes four household types, by income level and location, and estimates for each of them social reproduction (or household work) and leisure. This great level of detail permits an understanding of how the effects of economic changes on women vary, depending on their characteristics and circumstances, including their obligations and tasks within the household.

Two main trade strategies are described in the next sections. One experiment simulates abolition of tariffs on manufactured imports. Another illustrates the effects of nontraditional agricultural export promotion. It compares the impact of export incentives in horticulture, a promising though still small sector that uses a high share of female labor, with the impact of export incentives in tobacco and coffee, which are male-intensive crops. The simulation of promotion of horticultural exports is re-run with alternative parameter values to test the sensitivity of the results to different degrees of responsiveness of gendered aspects of the division of labor to economic change.²

Tariff Reduction in Manufacturing

In the early 1990s Zambia embarked on a program of tariff liberalization. On average, tariffs were lowered from 27 percent in the early 1990s to 19 percent in 1995. Further reductions have been recommended. Tariffs are higher, on average, in agriculture than in manufacturing, but it is in manufacturing that the bulk of imports (80 percent of the total) can be found. The simulation reduces tariffs in manufacturing, both in the labor-intensive sector and in the capital-intensive sector, to zero.

The abolition of tariffs increases the volume of manufactured imports, causing a depreciation of the exchange rate to restore the trade balance. As a result, imports other than manufactures, especially maize and other food staples, decline, while exports rise, particularly in agriculture. These changes in exports and imports cause domestic production to increase in most market sectors, especially commercial crops, maize, mining, and market services, which are among the most outward-oriented sectors.

The distributional impact of tariff reduction is affected by the tax policy used by the government to recover its loss of import revenue. Two alternatives are simulated: the government increases the income tax rate by

²A further experiment analyzes the effects of an improvement in Zambia's terms of trade resulting from a rise in the world price of copper. This experiment is described in the original paper but is not reported here.

a uniform number of percentage points for all income recipients (hence spreading the burden uniformly across households and enterprises) or the changes are larger for institutions with relatively high base-year rates. The latter indicates a more progressive tax system.

The impact on women's well-being varies according to their educational level and household type. Under uniform taxation, market employment increases most for women with either secondary education or no education, but wage rates rise most for women with primary education. Leisure declines for all women in poor households but increases for women in rich households. Female workers with higher education are therefore more advantaged, as a large proportion of them live in high-income families. Under progressive taxation, women with no education or primary education gain in terms of their leisure, as a result of the greater income enjoyed by their households (poor households, especially in rural areas). In these household categories, the level of social reproduction increases, too, but with fewer time inputs from uneducated female workers and more inputs from women with more education. Women with secondary education and tertiary education experience a decline in their wages compared with a small increase under uniform taxation.

Export Incentives in Agriculture

The performance of agriculture was disappointing during the 1990s, as the expected increases in productivity and diversification did not take place (see, for example, Deininger and Olinto 2000). The experiments described in this section compare the impact of export incentives in commercial crops (tobacco, coffee, cotton, and sugar) with the impact of export incentives in horticulture (roses, sugar beans, and onions) and groundnuts. These two types of crop have very different production structures. Commercial crops use more land and capital than other agricultural sectors and employ a higher proportion of male workers. The female workers in this sector (providing 41 percent of total labor time) do not have any education. By contrast, horticulture and groundnuts use very little land and capital and employ a higher proportion of women (60 percent of total labor time), the vast majority of whom have primary education. Thus choosing to support one crop or the other is likely to have a differential impact on women and men and on workers with different levels of education. For simplicity, export incentives are simulated in both cases by the introduction of a 50 percent export subsidy.

Commercial Crops

The introduction of a 50 percent export subsidy in commercial crops causes the volume exported to increase by 47.6 percent, but the total volume of exports increases only slightly. Output rises by 7.4 percent in commercial crops and falls by a small proportion in other agricultural sectors and manufacturing. Social reproduction and leisure decline, too, except in poor rural households, where they increase slightly.

The effect on the well-being of women differs by level of education. While women with higher education (who are a small proportion of the Zambian female working population) are only slightly affected, women with primary education (about 68 percent of the total female labor force) are negatively affected: their leisure time declines, on average, and so does their market participation, while their housework increases. Their wages are almost unchanged in absolute terms and increase marginally in relative terms. Women with no education benefit from increased market employment and higher wages, both in absolute and in relative terms, but at the expense of their leisure. They also participate less in social reproduction. It is even possible that uneducated female workers may not enjoy the higher revenue resulting from their increased participation in agriculture. Although the evidence is mixed, several studies suggest that in many African economies, women, especially if unskilled, provide unpaid labor to commercial crops managed by their male relatives, with no control over the income earned (Baden 1993).

Horticulture and Groundnuts

The introduction of a 50 percent export subsidy in horticulture and groundnuts production causes their export volume to increase by 62.7 percent and the total volume of exports to rise marginally. Output rises by 2.5 percent in horticulture and groundnuts and falls in other sectors, especially food, maize, and commercial crops. Leisure marginally falls, except in poor rural families, while social reproduction declines in all households.

The effect on the well-being of women appears to be more positive than in the previous simulation. Women with no education still benefit, although to a lesser extent, from increased market employment and higher wages. These small gains are, however, offset by reduction in their leisure and also by an increase in their housework in poor rural households. Women with primary education—the majority of the female labor force—gain the most in terms of market participation and wages but at the expense of their leisure. Because of women's greater participation than men in horticulture, social reproduction declines marginally also in poor rural families. Women working in horticulture are likely to have greater control over their higher

wages because the organization of production in this sector often differs from more traditional forms of agriculture. Production of flowers and high-value vegetables is often organized in large farms owned by nonrelations. A contractual wage labor force whose terms and conditions of employment are akin to those of industrial workers is often used (Joekes 1995). Participation in horticultural activities thus is likely to require no ownership of productive assets other than labor and less mediation through male relatives. The decline in the production of food (maize as well as other staple crops) is slightly larger than when growth of commercial crops occurs, with possible negative effects on the nutritional levels of women and children.

Gender-Differentiated Constraints in Supply Response

The simulation of export promotion in horticulture and groundnuts is re-run with alternative gender-related parameters. The gender and economics literature points to gender-differentiated market imperfections and structural limitations at the household level, which hamper women's ability to respond to economic incentives. One important constraint results from women's domestic responsibilities that prevent them from taking full advantage of new market opportunities (Elson 1992). The first experiment in this section increases responsiveness of housework to changes in its relative price (and hence more flexibility in the allocation of women's time between the market and the household).

Women are also constrained by norms governing the gender division of labor that often result in women not being allowed to take up "men's roles" (and vice versa), even when this would be economically efficient. The second simulation in this section increases the degree to which male and female workers in both the market and the household are substitutable in response to changes in their relative wages.

Women also often have less command over productive assets. In the last experiment, the availability of land and capital in horticulture and groundnuts is increased by 25 percent to assess the impact of better access by women to productive assets.

In summary, higher price elasticity of demand for social reproduction results in less loss of leisure time for women but also in a larger decline in household activities. Higher substitution elasticities in production seem to reinforce the distinction between "women's activities" (mainly in agriculture) and "men's activities" (mainly in nonagriculture) in market employment.

The experiment also has the effect of reducing social reproduction less, but this is offset by a larger decline in leisure for both women and men. The reallocation of assets increases both female market participation and wages but causes a decline in their leisure. It is not easy to say which of these changes improve women's well-being. It is likely that some of them would occur simultaneously, with some of the effects offsetting each other and some reinforcing each other.

Conclusions

The purpose of this study was to see what insights can be gained into the gender effects of trade in Zambia by using a disaggregated SAM and CGE model. The abolition of tariffs on manufactured imports resulted in smaller employment and wage gains for women than for men. The experiment showed also that what tax policy is implemented to recover loss of import revenue matters for income distribution. A progressive taxation that favors rural poor families benefits also uneducated women, whereas less progressive taxation causes larger gains for urban rich households and more-educated female workers.

The experiment introducing incentives in nontraditional agricultural exports made it apparent that women are favored more by expansion of horticulture and groundnuts than by expansion of commercial crops. It also made visible differences among women, between female workers with primary education, who are employed relatively more intensively in horticulture, and female workers with no education, who work largely as unpaid family labor in commercial crops. The simulation also showed that reallocation of productive assets to women's crops makes female workers more productive but reduces their leisure time.

Finally, the experiments highlighted the vulnerability of Zambia to changes in copper prices and the persistence of the copper sector in the economy.

The simulations showed how important it is to include social reproduction and leisure as sectors and thus to integrate the analysis of women's time in the household with their work in the market economy. They also highlighted that when there is great rigidity in gender roles, as well as in market structures, the positive effects of better price incentives are likely to be small. It is thus important to design complementary policies to reduce the many competing demands on women's time and to enhance their ability to respond to economic reforms.

Investment in Women and Its Implications for Lifetime Incomes

Agnes R. Quisumbing, Jonna P. Estudillo, and Keijiro Otsuka

This study examines the implications of gender differences in wealth transfers—farmland and education—on the lifetime incomes of men and women in the rural areas of Ghana, the Philippines, and Sumatra. Based on household surveys of three generations, we tested the hypothesis that parents bequeath their wealth to their sons and daughters in accordance with their comparative advantages in lowland and upland farming and in nonfarm jobs. Therefore, if sons and daughters have comparative advantages in lowland farming and nonfarming activities, respectively, we expect that sons receive a greater area of farmland, whereas daughters receive more schooling, since schooling is particularly important in nonfarm jobs.

Egalitarian bequest motives of parents, however, do not assure that “equal” outcomes between men and women will prevail in terms of lifetime or permanent income. If women face discrimination in making use of land or education, parents would rationally transfer their wealth to sons, even though the parents may be basically egalitarian. Eradicating discrimination may thus increase returns to women’s physical and human capital and encourage parents to invest in daughters.

For details, see Quisumbing, Estudillo, and Otsuka (2002).

Research Findings

Land Inheritance

If land bequest decisions are made in accordance with the comparative advantages of sons and daughters in farming, land will be bequeathed to men and women depending on their relative contribution to farm labor. Men inherit more land than women in the Philippines, where rice farming is intensive in male labor (Estudillo, Quisumbing, and Otsuka 2001). Supportive evidence was also obtained from Sumatra, where matrilineal inheritance has traditionally been practiced (Quisumbing and Otsuka 2001). In Kerinci, Sumatra, where both men and women work more or less equally on lowland paddy fields and upland agroforestry fields, men and women currently inherit both types of land equally. In Bungo Tebo, Sumatra, where men work primarily on rubber agroforestry and women specialize in lowland paddy production, men inherit rubber fields and women inherit paddy fields. Furthermore, in Ghana where uterine matrilineal inheritance has traditionally been practiced (see Chapter 24), wives and daughters began to acquire landownership through gifts from the husband or father, provided that they helped establish cocoa agroforests (Quisumbing et al. 2001a, b). It is no coincidence that at present women contribute about 30 percent of labor in cocoa farming and own nearly 30 percent of cocoa land. Thus, the relative importance of men's and women's labor inputs is an important determinant of the land transfers to men and women.

This finding does not imply, however, that women have never been discriminated against in intergenerational land transfers. In Ghana social discrimination against women persists, even though it has been weakened considerably over time. There is also the incidence of parental discrimination against daughters in land transfers. In contrast, there are cases of land transfers from the parents' to the respondents' generation in which mothers who own large land areas prefer to transfer their land preferentially to their daughters, as in the Philippines and Sumatra. The extent of discrimination against daughters in land transfers, however, seems to have decreased over time.

Schooling Investments

It may be misleading to analyze land transfers or schooling investment independently since both are alternative forms of intergenerational transfers. In the Philippines, among children 20 years of age and older, sons inherit more land but daughters receive more schooling. This result shows that land inheritance and schooling are close substitutes. Schooling may also be increasing in importance in the Philippines, where younger sons and

daughters receive almost equal levels of schooling at present, despite larger areas of expected land transfers to sons.

Evidence supporting a substitutable relationship between land inheritance and schooling, however, was not found in the Ghana and Sumatra studies. Both men and women are equally treated in land inheritance and schooling investments in the respondents' and children's generations in the Kerinci and Bungo Tebo sites. In contrast, women are disfavored in both land transfers and schooling in Ghana, even though the extent of such gender bias has been reduced appreciably over time. These differences may be due to differences in women's participation in nonfarm jobs. In the Philippines, women work primarily in nonfarm jobs, where educated women and men are equally treated. In the other two sites, both men and women work mostly on farms.

Overall Effects of Wealth Transfers on Men's and Women's Income

We examined the consequences of gender differences in land inheritance and schooling investments on the lifetime or permanent income of men and women. We assessed the effects of schooling and the gender composition of household members on income from agricultural production and household expenditure, a proxy for permanent income.

We find that schooling is not an important determinant of agricultural income, regardless of whether it is food crop farming or tree crop farming. Thus, we should not expect that increased schooling has significantly positive effects on agricultural incomes and efficiency, unless technological changes enhance returns to schooling.

Women's schooling, but not men's schooling, has positive and significant effects on per capita household expenditures in the Philippines, whereas the opposite relation holds in Ghana. This difference may occur because women are more educated in the Philippines and tend to work in nonfarm jobs, where returns to schooling are higher. In contrast, Ghanaian women in rural areas do not readily participate in nonfarm labor markets, a fact that, in turn, is likely to discourage investment in daughter's schooling in Ghana.

Based on these results, we estimated lifetime or permanent incomes of men and women. In the Philippines, the smaller farm income of daughters due to the smaller area of inherited paddy land is almost exactly compensated for by their larger nonfarm incomes due to their higher schooling attainments. In both Sumatra sites, sons' and daughters' incomes are largely equalized, reflecting the rough equality of agricultural land inheritance and the equal level of schooling between sons and daughters. In the case of Ghana, however, women's income is significantly lower than men's. Such a

persistent and significant income gap can be attributed largely to social discrimination against females in land transfers and schooling.

Policy Implications

Our three-country study suggests that efforts to improve the distribution of income and resources between men and women in rural areas will not be successful without policies to improve income-earning abilities and opportunities for women. In particular, we advocate policies to (1) extend and strengthen schooling systems in rural areas; (2) promote competition in nonfarm labor markets to eliminate discrimination against women; (3) reform property rights systems, in general, to be more equitable toward women; and (4) develop agricultural technologies that increase the returns to female labor, whether through increased demand or increased labor productivity.

Improve Schooling Systems in Rural Areas

Increasing women's educational attainment is an important part of any long-term strategy to improve gender equity in rural areas. Although the gender gap in schooling has closed in the Philippines and Sumatra sites, it continues to be an issue in rural Ghana, similar to other poor and isolated areas in other developing countries. Approaches to promoting gender equality in education have revolved around (1) reducing prices and increasing physical access to services, (2) improving the design of service delivery, and (3) investing in time-saving infrastructure (World Bank 2001).

Reducing prices and increasing physical access to educational services is important since parents' decisions to invest in girls' education is more sensitive to the price of education than their decision to invest in boys' education. Since girls' schooling is more sensitive to direct and opportunity costs, reducing the cost of schooling offers some of the most promising policy interventions to promote female education, such as school stipend programs, tuition subsidies, and scholarships for girls.

Parents' demand for girls' education also appears to be more sensitive than their demand for boys' education to the quality of schooling, the extent of learning, and teacher attitudes. To this end, training staff, reviewing and revising school curricula, and educating parents can all play important roles in ensuring that gender stereotypes are not perpetuated in the classroom and in the community.

Finally, investments that reduce distance to school and investments in basic water and energy infrastructure can help female enrollment rates in part by reducing the opportunity cost of schooling for girls. Similarly, increasing access to local health care facilities reduces the time women and girls need to spend on in-home care for sick family members. These investments mean fewer interruptions to women's paid work and to girls' schooling. To promote schooling of girls, however, these interventions are not sufficient. It is critically important to raise the return to investments in girls' schooling. The analysis in this study, as well as in others, shows that returns to schooling in farm production are low.¹ Returns to female schooling are even lower or negative. With such low returns, it is not surprising that resistance to investing in girls' education persists in many rural areas without adequate access to nonfarm employment.

Remove Barriers to Female Participation in Nonfarm Labor Markets

Given the limited labor absorption capacity of the agricultural sector, realizing the returns to female education in the long run will increasingly depend on women's ability to find nonfarm employment. Low or even negative returns to women's schooling in agriculture may act as a deterrent to parental investment in girls' education, as in our Ghanaian case study. The higher probability of obtaining nonfarm employment has gone hand-in-hand with higher educational attainment of girls in the Philippines. Thus, increasing competition and reducing barriers to female entry to nonfarm labor markets will be key to enabling women to realize the returns to their education. Some of the barriers to entry can be removed through legislation that prohibits explicit discrimination against women. But some of the other barriers may lie in the opportunity cost to women of participating in the nonfarm labor market. Women already tend to work longer hours than men, when both productive and domestic work are considered, and in virtually all countries, women perform a disproportionate share of household maintenance and care activities. Investments in time-saving infrastructure can reduce women's opportunity costs of participating in the labor market,

¹This finding is also supported by the majority of the existing literature (for example, Jolliffe 1998; Fafchamps and Quisumbing 1999), although there are a few exceptions (Foster and Rosenzweig 1996; Yang 1997).

while provision of child care enables women to work and older daughters to continue schooling rather than care for younger siblings.

Policies also need to change the way employers and educators think about women's employment. Hard numbers must be used to dispel myths about the expense of employing women. For example, recent International Labour Organization (ILO) research provides evidence from four Latin American and Caribbean countries that the "extra costs" of employing women, such as maternity leave or childcare, turn out to be quite insignificant. Indeed, bearing these costs in the short run reduces the long-run cost of absenteeism and job turnover and permits firms to retain more experienced women workers (Deutsch, Duryea, and Piras 2001). Finally, to promote competitive labor markets, policies to strengthen market competition among enterprises should be adopted. Those enterprises that discriminate against women are less likely to survive in competitive market environments. Moreover, it is important to recognize that the promotion of competitive labor markets will stimulate investments in the schooling of female children.

Reform Property Rights Systems

The reform of property rights systems and the legal framework is crucial to attaining gender equity. Legal reform is necessary to change statutory laws to strengthen women's entitlements and to increase the enforceability of their claims over natural and physical assets. Gender disparities in natural and physical capital persist partly because the legal framework supports property rights systems that are biased against women (Agarwal 1994; Quisumbing and Meinzen-Dick 2001).

Land titling is often mentioned as a solution to gender disparities in land rights. Land titling is feasible, however, only if land rights are sufficiently individualized, and many programs have failed largely because of premature implementation. To be fair, men and women should be equally qualified for acquiring land titles, or, if appropriate, titles could be awarded jointly to men and women. Judging from the experience of Ghana, the promulgation of the Intestate Succession Law, which stipulates how property should be bequeathed to the spouse, children, and other family members, is likely to be an effective policy option, which would facilitate less gender-biased land inheritance systems in customary land tenure areas. Its effectiveness also depends, however, on women's knowledge of the provisions of the law and their ability to enforce their claims in court.

Develop Technologies to Increase Returns to Women's Labor

While returns to education are higher in the nonfarm sector, the task remains to improve incomes of those who remain in the agricultural sector. To this end, agricultural research can be directed toward technologies to increase the returns to women's labor. In labor-abundant economies, such as those of Asia at the time of the Green Revolution, these technologies could take the form of labor-intensive technologies that increase the demand for women's labor. In labor-constrained economies, these technologies could be those that make women's labor more productive—such as technologies to improve the efficiency of food processing or fuel collection. These technologies could also consist of new crops that are more profitable and offer a higher return to women's labor.

It is important that women are empowered to be able to benefit from the increased value of their time. The development literature is replete with stories of interventions that aimed to increase women's income-earning capabilities, raise the return to labor, or even improve the productivity of women's crops, but failed because they did not take into account intrahousehold dynamics as well as possible resistance from men (Braun and Webb 1989; Dey 1985). Gender equity is not incompatible with productive efficiency. It is possible that technologies that increase the returns to women's labor will also serve to improve the value of their outside options, thereby increasing their bargaining power within the family and enabling them to take advantage of new opportunities.

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Contributors

Christopher Adam is a University lecturer in development economics at St. Cross College, University of Oxford.

Michelle Adato is a research fellow in the Food Consumption and Nutrition Division of the International Food Policy Research Institute, Washington, D.C.

Akhter U. Ahmed is a senior research fellow in the Food Consumption and Nutrition Division of the International Food Policy Research Institute, Washington, D.C.

J. B. Aidoo is a research fellow at the Institute of Land Management and Development, University of Science and Technology, Kumasi, Ghana, and a member of parliament in Ghana, representing the Western Region.

Harold Alderman is lead human development economist, Africa Region, at the World Bank.

Alok Bhargava is a professor of economics at the Department of Economics, University of Houston, Texas.

Bénédicte de la Brière is a U.K. Department for International Development adviser to the Secretary for the Evaluation of Social Programmes in the Ministry of Social Assistance and Promotion, in Brasília, Brazil.

Howarth Bouis is director of the Biofortification Challenge Program, an alliance of Future Harvest Centers and other institutions from developing and developed countries working collaboratively to develop and disseminate micronutrient-dense staple food crops to improve the health and nutrition of the poor.

Jean-Paul Chavas is a professor in the Department of Agricultural and Applied Economics, University of Wisconsin-Madison.

Nora Coj de Salazar is a psychologist currently working at the Hogares Comunitarios Program in Guatemala.

Carlo del Ninno is senior economist in the Social Safety Nets team of the Social Protection Unit of the Human Development Network, the World Bank.

Jonna P. Estudillo is an assistant professor at the School of Economics of the University of the Philippines.

Marcel Fafchamps is reader in the Department of Economics and Professorial Fellow at Mansfield College, Oxford University. He also serves as deputy director of the Centre for the Study of African Economies.

Marzia Fontana is a lecturer in the Department of Economics at the University of Sussex. At the time of contributing to this work she was a research analyst at the Trade and Macroeconomics Division of the International Food Policy Research Institute, Washington, D.C.

Elizabeth Frankenberg is assistant professor at the Department of Sociology, University of California, Los Angeles. Her research focuses on health and family demography, with an emphasis on Southeast Asia.

Lawrence Haddad is a senior research fellow in and director of the Food Consumption and Nutrition Division of the International Food Policy Research Institute, Washington, D.C.

Kelly Hallman is a research associate in the Policy Research Division, Population Council, New York.

John Hoddinott is a senior research fellow in the Food Consumption and Nutrition Division of the International Food Policy Research Institute, Washington, D.C.

Bill Kinsey is a senior research associate at the Institute of Development Studies, University of Zimbabwe, and a research fellow at the Free University Amsterdam.

Ethan Ligon is associate professor of agricultural and resource economics at the University of California, Berkeley.

John A. Maluccio is a research fellow in the Food Consumption and Nutrition Division of the International Food Policy Research Institute, Washington, D.C.

Julian May is associate professor and directs the Poverty and Population Studies Program in the School of Development Studies at the University of Natal, Durban, South Africa. He has been a lead researcher in a number of research projects in South Africa, including the KwaZulu-Natal Income Dynamics Study.

Reynaldo Martorell is professor of international nutrition and chair of the Department of International Health, Rollins School of Public Health, Emory University, Atlanta, Georgia.

Bonnie McClafferty is a senior communications specialist in the Food Consumption and Nutrition Division of the International Food Policy Research Institute, Washington, D.C.

Ruth Meizen-Dick is a senior research fellow in the Environment and Production Technology Division of the International Food Policy Research Institute, Washington, D.C.

Dubravka Mindek is an assistant director in the Division of Domestic Violence Prevention in the Women and Health Program of the Ministry of Health, Mexico.

Ruchira Tabassum Naved is gender and reproductive health specialist at International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR, B), Centre for Health and Population Research.

Aida Ndiaye is a consultant to the Food Consumption and Nutrition Division of the International Food Policy Research Institute, Washington, D.C.

Keijiro Otsuka is director of the graduate program of the Foundation for Advanced Studies on International Development (FASID), a research and educational institution focusing on development issues supported by the Ministry of Foreign Affairs of Japan.

Michael J. Paolisso is an associate professor in the Department of Anthropology, University of Maryland, College Park.

Ellen Payongayong is visiting outreach specialist in the Mozambique Food Security Project of the Department of Agricultural Economics, Michigan State University. She is outposted to the Ministry of Agriculture and Rural Development, Maputo, Mozambique.

Agnes R. Quisumbing is a senior research fellow in the Food Consumption and Nutrition Division of the International Food Policy Research Institute, Washington, D.C.

Usha Ramakrishnan is an assistant professor in the Department of International Health, Rollins School of Public Health, Emory University, Atlanta, Georgia.

Shibesh Regmi is the director of Action-Aid Nepal.

Marie T. Ruel is a senior research fellow in the Food Consumption and Nutrition Division of the International Food Policy Research Institute, Washington, D.C.

Nevin Scrimshaw is institute professor emeritus at the Massachusetts Institute of Technology and senior adviser for the food and nutrition program at the United Nations University.

Manohar Sharma is a research fellow in the Food Consumption and Nutrition Division of the International Food Policy Research Institute, Washington, D.C.

Emmanuel Skoufias is senior research economist in the Research Department of the Inter-American Development Bank, Washington, D.C.

Lisa C. Smith is a research fellow in the Food Consumption and Nutrition Division of the International Food Policy Research Institute, Washington, D.C., and a visiting faculty member at the Department of Agricultural and Resource Economics at the University of Arizona, Tucson.

Priscilla Cooke St. Clair is assistant professor in the Department of Economics at Pacific Lutheran University, Tacoma, Washington.

Duncan Thomas is a professor in the Department of Economics, University of California, Los Angeles.

Christopher R. Udry is professor of economics and director of the Economic Growth Center, Yale University, New Haven, Connecticut.

Margreet Zwarteveen is lecturer and researcher in the Irrigation and Water Engineering Group, Department of Environmental Sciences, Wageningen University.

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—Jere Behrman, W.R. Kenan, Jr. Professor of Economics, and Director of the Population Studies Center, University of Pennsylvania

Agnes R. Quisumbing is a senior research fellow at IFPRI, where she leads research on gender issues.



INTERNATIONAL FOOD
POLICY RESEARCH INSTITUTE

2033 K Street, NW
Washington, DC 20006-1002 USA
Tel: +1-202-862-5600 • Fax: +1-202-467-4439
Email: ifpri@cgiar.org • Web: www.ifpri.org

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