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Making the Case for the Gender Variable : Women and the Wealth and Well-being of Nations

Office of Women in Development
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Making The Case For The Gender Variable: Women and the Wealth and Well-Being of Nations

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LIST OF ACRONYMS

ADEMI	Association for Development of Microentrepreneurs, Incorporated
ADP	Agricultural Development Project
AID	Agency for International Development
BRIDGES	Basic Research and Implementation in Developing Education Systems
CEB	Children Ever Born
CFA	African French Community
DISIND	Disparity Index
EAs	Extension Agents
ECA	Economic Commission for Africa
EPZ	Export Processing Zone
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GER	Gross Enrollment Rate
GERF	Gross Enrollment Rate for Females
GNP	Gross National Product
HYVs	High Yield Varieties
IFAD	International Fund for Agricultural Development
ILO	International Labour Organization
INSTRAW	International Research and Training Institute for the Advancement of Women
LDC	Less Developed Country
LEIG	Livelihood, Employment and Income Generation
LFPR	Labor Force Participation Rates
ME	Microenterprise
MEs	Microentrepreneurs
PLSS	Peruvian Living Standards Survey

RDA	Recommended Daily Allowance
SIMME	Urban Microenterprise Multiplier System (Guatemala)
SMAM	Singulate Mean Age of Marriage
TFR	Total Fertility Rate
UN	United Nations
UNIDO	United Nations Industrial Development Organization
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPE	Universal Primary Education
USAID	United States Agency for International Development
VEWs	Village Extension Workers
WFS	World Fertility Survey
WID	Women in Development
YAR	Yemen Arab Republic
2SLS	2-stage least square

FOREWORD

A.I.D. was among the first donor agencies to recognize the central role of women in economic and social development. A.I.D.'s on-going efforts to incorporate consideration of gender as a critical variable in the development formula are serving as a model to others. The Agency has supported a wide array of research, technical assistance, training, and information sharing on this topic over the years, and has begun the sometimes difficult task of gathering and assessing the impact of improved integration of gender consideration in all phases of the economic development programming cycle. One effort to document these efforts is presented in this report.

While using and expanding women's productive capacity is seen as a critical, and to some, necessary condition for sustainable, broad based economic growth and social progress, documenting clearly the real-world experiences that support this hypothesis is complex and confusing. The information and data are disparate, of varying quality and statistical purity, and housed in often incompatible software in organizations that don't usually communicate. The work of attempting to make consonant the panoply of information and data to make a statement are to be commended. The findings and conclusions of the study will be of interest to both scholars and practitioners in the fields of economic development as well as women in development. It seeks to support the hypothesis that attention to people's gender is a necessary element in meeting project objectives and contributes significantly to achieving overall development goals.

PREFACE

In 1970, in *Woman's Role in Economic Development*, Ester Boserup wrote that a lack of basic information prevented her from drawing some conclusions in her examination of women's involvement in and contribution to economic development. Her hope was that this book would "...help to stimulate further study, including the provision of fresh statistical evidence." Today, nearly 20 years later, the Office of Women in Development finds that it must reiterate this plea in its own preface. This is not to say progress has not been made in gathering better and more gender-disaggregated statistics and in the integration of women into national economies. Rather, it reinforces the continuing need for new and innovative data gathering and assessment activities to support these processes.

Dr. Rae Lesser Blumberg was given the enormous task of examining developing country studies and statistics and documenting the benefits of integrating women into national economies. The result is a document that overflows with rich, diverse examples that clearly "make the case" for considering gender in economic development. Her case examples, lessons learned, and sectoral analyses alone make this report a valuable addition to the growing body of knowledge about women's economic activities in developing countries.

The parallels with Boserup's book continue as neither had the luxury of being able to compile their own statistics. This report is basically a comprehensive "roundup" of what was already out there in late 1988 that could be used to substantiate the fact that women's contributions to national economies are large and rapidly growing larger. Ideally, Blumberg would have found consonance among the research; in reality, she found less-than-perfect data upon which to base statements about causal relationships. Thus, in the document's parts lies a revelation about the weaknesses of our data and information; while as a whole - when brought together, its strength is apparent. The wealth of examples compiled in this report will help to identify these weaknesses and focus on where rigorous data gathering remains to be done.

Blumberg had to work with what was out there; her assignment was to gather together and to clean up the data so decision-makers and researchers would have *something* to work with. Our challenge now is to recognize what needs fixing and to identify indicators that will facilitate the gathering of better or more appropriate data for future planning, analysis, and tracking purposes.

ACKNOWLEDGEMENTS

This monograph was born from the best kind of marriage between an action-oriented agency and academia. The Agency for International Development's Office of Women in Development is charged with promoting the integration of women into A.I.D.'s development assistance programs and projects. As a pro-active entity, it continually works to enhance the case for "taking the gender variable into account" in all phases of A.I.D.'s development activities, and has been doing so with steadily increasing success since 1975. It continues to deepen our understanding of why it is good for a country's development, and not just its women, to fully include them into both the activities and the benefits of planned development.

In the summer of 1988, the Office of Women in Development (hereinafter, WID Office) was asked to provide input for a major report being prepared by A.I.D. for Congress. Ron Grosz, who had been introduced to my work on gender and development through his WID Office colleague, Bruce Horwith, asked me to undertake what was originally conceived of as a technical report aimed at two purposes. First, it would serve the immediate objective of the pending report to Congress and second, it would address the larger goal of presenting the "state of the art" of what was known about the benefits of integrating women into national economic development. Through the vision of Kay Davies, head of the Office since 1984, and Ron Grosz' strong and unflagging encouragement, the report began to expand in scope.

My academic work involves theory as well as research, and I had been working on a theory of gender and development as the next step beyond my "general theory of gender stratification." I also was working on a book, *Women and the Wealth of Nations*, that ties together all my empirical work on gender and Third World development with my evolving theories. This provided me with a running start to consider the benefits that accrue to women, their families and ultimately, their nations, as the result of their productive activities—especially those that generate income under female control. Ron Grosz encouraged me to expand my approach beyond the economic to consider human capital as well. Soon, sparked by challenging intellectual exchanges with Ron and his WID Office colleague, Tulin Pulley, and aided by the first rate logistical and research support of Laura Raney (then a special assistant in the WID Office), I was delving into terrain I never before had explored systematically. The consequences that flow from educating girls and women, I learned, were at least as felicitous as those that emerge from women's production and control of income—and easier to justify to those uncomfortable with the idea of women as valuable economic producers—and income managers—in their own right. In short, there was a strong case to be made not only for women's contribution to wealth but also to well-being.

"Making the case for the gender variable" also was facilitated by the help I received from everyone in the WID Office. I would like to expand my roster of thanks to include Phillip Boyle,

Mary Herbert, Donna Sidiqui and Jeffery Franklin. Also, it was Ron Grosz who put me in touch with Scott Moreland of the Research Triangle Institute, who, along with Ernesto Cuadra from the Harvard Institute of International Development, was, by happy coincidence, compiling a data base on female education for a larger A.I.D. project known as BRIDGES. "Making the case" for women's education was much advanced thanks to the regressions he ran for me in conjunction with his colleague, Luis Crouch, and assistant, Luis Cubeddu.

As the report evolved into a full-fledged monograph or short book, two excellent WID Office editors successively entered the picture: Mari Clark and Kathleen Moran. Mari Clark's streamlining of my prose transformed my draft into a much more inviting and accessible work, and Kathleen Moran has turned it into a finely formatted and finished volume.

In addition, I want to thank the many authors of draft reports and works in progress who discussed their findings and shared their unpublished materials with me, and the many colleagues and friends who work in Women in Development who have shared their thoughts and writings. Naming you would present a list about half the length of the bibliography—in which many, although not all of you, are represented.

Finally, much of the research and writing took place in San Diego, not Washington. I would like to thank Huma Ahmed Ghosh who did her usual top-notch job in helping me with the bibliography, and all the University of California, San Diego colleagues who read and reacted to at least one version of the Executive Summary and/or parts of the draft: Bennett Berger, Mary Freifeld, Joseph Gusfield, Bennetta Jules-Rosette, Martha Lampland, Lorna Lueker, Gershon Shafir, Barbara Stewart, Carlos Waisman and Jackie Wiseman.

EXECUTIVE SUMMARY

1. Introduction: Women and the Wealth of Nations

A case is made for gender as an essential and critical variable in the "development equation." Empirical evidence demonstrates that:

- Women worldwide make major contributions to the wealth of nations; and
- The use and expansion of women's productive capacities is a necessary condition for social and economic progress.

The discussion focuses on two intertwined ways in which women contribute to the economic and human resource "wealth" of nations. These are via:

- Women's productive activities, which, in many developing countries, contribute significantly to the food supply, the large informal sector, service and farm labor forces, and, in some, to the export manufacturing labor force; and
- Women's education, which can lead to lower fertility, better family health, reduced infant and child mortality, higher formal labor force participation, and greater economic growth.

EXAMPLES OF WOMEN'S CONTRIBUTIONS TO NATIONAL ECONOMIC GROWTH

(1) According to recent estimates, the growing formal labor force participation and rising female/male earnings ratio of U.S. women between 1890 and 1980 were associated with a growth in national income per capita that exceeded the growth in male earnings by 28 percent. During this same period, women's teaching for low wages made possible the mass education that added another 12-23 percent to national income.

(2) In the LDC's specializing in export manufacturing, there is a strong relationship between increase in female industrial employment, the growth of manufactured exports, and national economic growth.

OVERVIEW OF WOMEN'S CONTRIBUTIONS TO THE WORLD ECONOMY

Overall, women are estimated to comprise 41 percent of the measured labor force in developed countries and 32 percent in developing ones. These statistics, however, are now known to undercount women's productive activities. Women in developing countries play an even greater role in the sectors of the economy that are poorly measured by national statistics—the urban informal sector, low resource farming and marketing, and unpaid family productive labor. Moreover, women's unpaid household labor, if given economic value, would add an estimated four trillion dollars, or about one-third, to the world's annual economic product.

2. The Impact of Women's Production and Control of Income

A great deal of data support the argument that the development impact of women's productive activities is heightened where they generate income under female control. The predominant development model of the household, however, precludes considering gender-disaggregated control

of income, since it treats the household as a shared enterprise described by a single production function. Therefore, a critique of this "black box" model of the household is presented and supported by evidence of the widespread existence of an "internal economy of the household" with a distribution of labor and resources based on age and gender that is not necessarily equitable. These dynamics vary cross-culturally. But everywhere, it makes a great difference which person in the household receives information, who does the work, and who gets the income. This has far-reaching consequences for the success or failure of development efforts at both micro and macro levels.

WOMEN'S USE OF INCOME UNDER THEIR CONTROL

Many studies support the proposition that income under female control (relative to male-controlled income) is a major determinant of women's overall status. Moreover, numerous studies also support hypotheses that income under women's control:

- Is most often spent for children's nutrition and the family's "basic human needs," especially among women with provider responsibilities; and
- Generally enhances women's decision-making power within the household regarding childbearing, economic issues, and domestic/family welfare.

Additionally, women with provider responsibilities tend to:

- Allocate their labor toward activities that put income and/or food under their direct control and, when feasible, away from activities that do not, even if the latter are more profitable; and
- Respond more readily than their male counterparts to easing of constraints on own-account production or modestly increased incentives. (This may be largely because many of these women urgently need income, but earn less and have fewer resources than men—thereby having lower opportunity costs.)

Empirical evidence from a wide array of countries provides support for these hypotheses. For example, studies of the SEMRY I irrigated rice project in Cameroon and various other development projects in Africa present cases in which women were expected to contribute labor but the direct returns went to their husbands. In all cases women provided less labor than expected and the projects suffered. A study of the effects of a new road on a Cameroonian village showed that women increased their production of own account perishable food much more than men, even though men's crops brought a sharply higher rate of return.

IMPLICATIONS FOR THE AFRICAN FOOD CRISIS

These findings have serious implications for the food crisis in Africa. African women farmers could be the single most cost-effective available resource to alleviate this crisis, since they raise as much as 80 percent of the locally grown food crops. In most ethnic groups, men and women have

at least partially separate income streams and spending obligations. Women typically have heavy responsibilities to provide for their children and thus need income and/or food under their control. Accordingly, the model of the household as a unitary pooling unit fits poorly here. Yet it has guided most development planning, often with negative results. Women are almost always bypassed by extension, training, inputs, and credit programs. Most food crop development projects have failed to target women producers. Almost all ignore women's incentives and may unwittingly undercut their income—often with negative consequences for the project, the women, and their families. These practices make inefficient use of scarce resources and appear to be an important, albeit unheralded, factor in the African food crisis.

3. Women Producers' Contributions and Constraints

FARMING AND THE INFORMAL SECTOR: Women are estimated to produce more than half the food in developing countries. Considering the full farming system (not just the measured labor force), the UN regional commissions calculate that women do 60-80 percent of the agricultural labor in Africa and in Asia, and 40 percent in Latin America. The rapidly growing informal sector in developing countries is absorbing an estimated 40-70 percent of urban workers, with women predominating in many regions.

WOMEN FARMERS' PERFORMANCE: One econometric study has found that Kenyan women farmers obtained higher crop yields than males, when women's more limited access to credit, education, fertile soil, commercial fertilizer, extension, etc., was controlled statistically. Several less quantitative studies also have found women producing as much as or more than comparable men. In actual practice, however, few women farm with resources comparable to men, and their production lags behind men's.

WOMEN MICROENTREPRENEURS' PERFORMANCE: Various quantitative studies of informal sector, microenterprise credit projects in Latin America and Asia indicate that women are as good as or better credit risks than men. Further, a study in the Dominican Republic found that women's clothing/textile businesses were growing faster than men's on several parameters (e.g., sales, employment). In general, the more successful microenterprise credit projects have eliminated constraints that prevent women in particular, and poor people in general, from getting aid.

RURAL WOMENS' PRODUCTION CONSTRAINTS: In low resource agriculture, there is no comparable reduction of constraints. Women labor under limitations to their productivity such as the time required for routine domestic tasks (fetching water and firewood, processing crops and cooking), as well as inadequate access to extension and other farming aids (credit, inputs, etc.).

EASING THE CONSTRAINTS: Reducing these constraints is a means to tap women's productivity for development.

> Time saving: for example, a computer simulation projected that several looming economic crises in the Yemen Arab Republic could be averted by reducing the time rural women in the average household spend fetching water and fuel/wood and cooking from 11.5 to 1.7 hours/day—just through improved water supplies and provision of cooking gas. This would increase women's agricultural productivity in an economy with declining agriculture and rising food imports. It would also provide girls time to attend school. Some girls could then become teachers to replace the foreigners who now teach.

Extension, Credit, and Inputs: Aside from three S.E. Asian nations, only since the mid-1980s have a few other countries (mainly in Africa) begun to target women farmers. The number of female extension clients now is growing there. Women farmers have been able to work well with male extension agents (as well as the few female agents) except in areas of female seclusion. But many women clients—who have almost no access to formal credit or subsidized inputs—cannot afford to buy all of an extension "package." Accordingly, production increases may be inhibited when the new practices are only partially adopted.

Extension planning must take into account women farmer's special skills (e.g., knowledge of food crops, ability to share knowledge and inputs with other women) and also their special constraints (e.g., limited time and resources, less and poorer land, gender role ideals that restrict movement and assertiveness). Cultural practices also must be considered (e.g., in Africa there is a widespread preference for extension contact in women's groups rather than individually).

WOMEN IN MARKETING: Females often play important roles at all levels of agricultural commodities distribution, particularly in West Africa. Ghana and Nigeria have long traditions of women filling important roles in trade. In Ghana, however, recent government policies severely restricted women's trading activities. This has damaged the country's food distribution system and its economy. In many countries, women street sellers, especially food vendors, also suffer from government regulatory pressure which may have reduced food availability in those nations as well.

In sum, female production and income affect wealth and well-being at levels ranging from the woman and her family to her nation and even region.

4. The Consequences of Women's Education

There is worldwide evidence that the education of women is associated with (1) a later age of marriage; (2) increased contraceptive usage; (3) lower fertility (although in some countries, those with partial primary education have slightly higher fertility than those with no education); (4) dramatically reduced infant and child mortality; (5) improved child nutrition and general family health; (6) greater participation in the waged, modern sector labor force; (7) higher earnings; and (8) increased national development as measured by GNP.

The first seven indicators almost always occur later in the life course than education, so it is plausible to conclude that female education plays a causal role. Indeed, the evidence indicates that mothers' education almost invariably has a stronger effect than fathers' (or "education" not disaggregated by gender) on lowering fertility and infant mortality and improving family health. New evidence that reductions in fertility enhance national income growth further underline the importance of giving females the educational and economic resources that facilitate their lower fertility. The last indicator, national growth and development, is associated with higher levels of female education and a lower disparity in the proportion of females relative to males in school. There is not enough evidence at the moment, however, to untangle the direction of causation in what is clearly an interactive, synergistic process. Nonetheless, education, per se, is a recognized predictor of national growth.

The enrollment of females in school has increased from 95 million in 1950 to 390 million in 1985 and the disparity between the proportion of boys vs. girls in school has shrunk a little. However, the gap in the numbers of girls in school, compared with boys, is growing—as are the numbers of female illiterates and school age girls not in school. Thus, even though education is the area where females have made the most progress since World War II, the picture is not an entirely positive one.

5. Conclusions and Selected Policy Implications

The most general conclusion is best expressed by Sivard: "What is good for women is also good for the society at large." The material presented makes a strong case for the macro and micro level contributions of women to the wealth and well-being of nations. Even greater future gains in women's productivity are possible if present constraints to their production, marketing, and education can be reduced.

Given time and space limitations, only four policy implications are discussed, although more could be drawn from the data.

- Gender must be tracked in projects, programs, and policies, and these should be adapted to overcome special constraints on women's productivity, participation, and access to benefits. For projects, gender-disaggregated data should be collected at the baseline, monitoring, and evaluation phases, so timely adaptations can be made.

- Attention to women farmers' skills, incentives, and constraints could be the single most cost-effective approach to alleviating the African food crisis.

- Strong efforts should be made to identify and serve women in microenterprise credit projects. The "lessons learned" from the most successful of these projects, particularly the fact that women are as good as or better credit risks than men, must be applied to policies, programs, and projects.

- Female education should be given higher priority, but not in a "zero sum game" manner which detracts from male education. A dollar spent on boys' education and not matched by a dollar for girls' education may be lost to a developing nation because of the cost of the higher fertility of those girls as well as the poorer health and lower infant/child survival rates of their families and their own reduced productivity.

In summary, despite some gaps in our knowledge, we already know enough to call for and implement the inclusion of gender as essential and critical to the "development equation."

CHAPTER ONE

Introduction: Women and the Wealth of Nations

Few policy issues have had as rapid a rise as that of Women in Development (WID)—specifically, the integration of women into Third World economic development. It was only in 1970 that Ester Boserup, a Danish economist, published the pathbreaking book, *Woman's Role in Economic Development*, that first brought this issue to world attention. In a mere three years, the United States Foreign Assistance Act of 1973 had been amended to require that henceforth, U.S. development assistance:

> shall be administered so as to give particular attention to those programs, projects and activities which tend to integrate women into the national economies of foreign countries, thus improving their status and assisting the total development effort (Section 113, better known as the "Percy Amendment").

The United Nations proclaimed 1975 as International Women's Year, and sponsored the first world conference on women in Mexico City. Women's role in development was a major focus—as it was in the U.N.'s Decade for Women (1976-1985). Within that decade, virtually all the major international development donors and multilateral development banks and agencies adopted policies calling for the integration of women into the activities and benefits of economic development. Despite the meteoric rise of the integration of women in development as a proclaimed policy, however, implementation has proceeded at a much slower pace.

One reason for the lag has been the persistent perception by many development policymakers, practitioners and academics that women are not active agents in development—and that resources targeted to them will have little impact beyond the women themselves. To the contrary, this monograph argues that enhancing women's productive activities, income, and education results in a "multiplier effect" that brings benefits to every level from the woman and her family to whole nations and even regions. In other words, this monograph is aimed at "making the case for the gender variable."

Gender is both an essential and a critical variable in the "development equation" because:

- Women worldwide make major contributions to the wealth of nations; and
- The use and expansion of women's productive capacities is a necessary condition for social and economic progress.

When the gender variable is ignored in development planning, the "development equation" is "underdetermined." Conversely, inclusion of the gender variable improves development planning and outcomes (Anderson and Chen 1988; see also Blumberg forthcoming).

This monograph presents empirical support for these assertions, focusing on two important, intertwined ways in which women contribute to the economic and human resource development, and hence the "wealth," of their nations. These are via:

- Women's productive activities, which often take place in the least measured sectors of their country's economy (e.g., low resource farming, urban informal/microenterprise sector); and
- The education of women, which affects health, fertility, formal labor force participation and economic growth.

In addition, this monograph presents strong evidence that the development impact of women's productive activities is intensified where they generate income under women's control.

The following examples serve as an introduction to the larger goal of this monograph—to make a general case about "women and the wealth of nations" and the need for incorporating gender into the development equation. Specifically, they demonstrate the link between women's labor and national economic growth.

1.1 Examples of Women's Contributions to National Economic Growth

There is evidence that women enhance their nations' economic growth and income through the amount and nature of their participation in the measured labor force.[1] As a first example, in the United States, women's labor has significantly contributed to the economic growth that, from 1890-1980, transformed the country into the world's foremost industrial power. Goldin (1986) provides compelling empirical documentation for U.S. women's contribution to the wealth of the nation:

- By the definitions of the United States Population Census, the labor force participation rate of prime-aged females (15-64 years old) rose from 19.6 percent in 1890 to 59.9 percent in 1980, and the female component of the labor force increased from 17 percent to 43 percent. Not only did the labor force participation rate of women expand, but the ratio of female to male full-time earnings increased as well, from 0.46 to 0.60 over the last century.
- The expansion of the female labor force as conventionally measured and the rise in the female/male earnings ratio were associated with a growth of national income per capita that exceeded the growth in male earnings by 28 percent. Had the female labor force not expanded over this period, national income per capita would probably have been at least 14 percent lower than it actually was (Goldin 1986, 557).

Goldin's analysis also indicates that 90 percent of U.S. women's contribution to national growth was made between 1950 and 1980. Moreover, women's work in teaching may have provided the basis for another source of increase in national income throughout the 20th century (Carter 1986,

[1] The nature and extent of undercounting of women's economic activities in current labor force statistics is discussed in section 4.6.

598). Had women not been willing to teach for low wages, when men generally were not, mass education might have been too expensive to be politically feasible (Fishlow 1966, 435). The expansion of mass education raised the stock of education per laborer. This increased real U.S. national income from 12 percent to 23 percent over this century (Carter 1986, 598, citing Denison 1962). Thus, U.S. women, through their work in general plus the human capital created by their teaching, have contributed formidably to the "wealth of their nation."

As a second example, the developing countries that have grown the fastest since World War II, such as Hong Kong, Taiwan, Singapore, and South Korea, gave early and strong emphasis to the export of manufactured goods produced with a greater reliance on women workers:

- Worldwide, women in 1980 constituted 32% of the measured labor force and 26.5 percent of the industrial labor force—up from 20 percent in 1960 (Hopkins 1983).
- In fast-growing Hong Kong and South Korea, women made up 50 percent and 43 percent, respectively, of paid manufacturing employees (Joekes with Moayedi 1987, 23, based on the *ILO Yearbook of Labour Statistics*).
- But in slower growing Malawi and Kenya, women formed only 4 percent and 9 percent, respectively, of the manufacturing labor force.
- And in the rapidly expanding export processing zones (EPZs), located mainly in Asia and the Latin America/Caribbean region, women held 80 percent of the 1,000,000 jobs (UNIDO 1980).

Worldwide, there has been a strong relationship between the rate of growth of female industrial employment, economic growth in general, and growth of manufactured exports in particular (Joekes 1986, 24).[2] As in the case of mass education, women's willingness to work for low wages has helped the growth of their countries. In the EPZs, low female wages have enhanced their competitive advantage in the world market.[3]

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[2] There is disagreement whether these jobs help or exploit women. Joekes with Moayedi (1987) give a thorough overview. On the negative side, harsh working conditions and health and safety hazards are fairly common. Also, 80% of female export processing workers are under 25 (ILO/UNCTC 1985), indicating that some women are "cycled out." Preference for young workers is stronger in electronics than garments. On the positive side, studies show that these women generally express satisfaction with their jobs and lives (e.g., Kusterer, et al. 1981; Blumberg 1985, 1989a; Tiano 1986; Foo 1987). In most instances, income is higher than in agricultural, domestic, or informal sector occupational alternatives. In addition, these young women, who generally have above-average education for their countries, tend to delay marriage and/or childbearing which, in many cases, would jeopardize their jobs.

[3] It may well be that developing countries which have chosen protected import substitution industrialization (e.g., Argentina) have more masculine, higher wage labor forces in manufacturing compared with those which have chosen export-oriented industrialization with more female, lower wage labor forces. There is little question that the latter have performed better since 1950.

1.2 An Overview of Women's Contributions to the World Economy

First we will examine the strongly differentiated regional patterns of women's work and provider responsibilities. According to ILO 1985 estimates, women constituted 41 percent of the total labor force in developed countries and 32 percent in developing nations. Since 1950, the rate of growth of female labor force participation "has outstripped the rise in male workers by two to one" (Sivard 1985, 12). And this refers only to the measured labor force.

There is strong regional and cultural variation in women's productive labor. Without question, women in the Eastern European communist countries have the highest rates of labor force participation, both absolutely and in relation to males. Most are wage earners in the formal sector. Provider expectations, that they *should* contribute, are also very high.

Women in the United States, Western Europe, and the other industrial capitalist countries have somewhat lower levels of labor force participation and provider expectations. But since about 1950, these women have significantly increased their labor force activity. It is now the statistical norm for married women to work in the United States and in a number of Western European nations. It remains to be seen whether a social norm—that married women should contribute to family sustenance—will follow. Most of women's labor force participation in these nations is in the formal sector, though less so than in Eastern Europe. Overwhelmingly, these women work in service jobs (e.g., 78.7 percent of U.S. women in 1982, per ILO/INSTRAW 1985, 28).

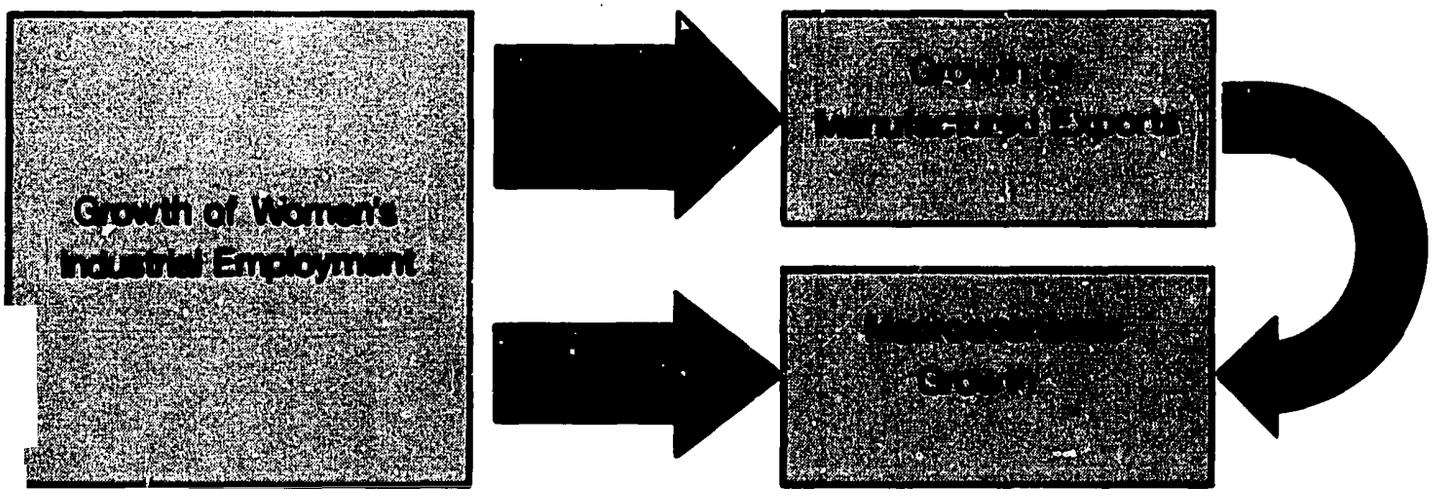
Turning to the less developed countries (LDCs), in rural Africa, women generally have strong provider obligations. They accomplish these via low resource farming and, especially in West Africa, small-scale trade. In urban Africa, female participation in the formal labor force is quite low.

Southeast Asia is another region of the developing world with traditionally high female rates of economic activity. Women have long been involved in agriculture and, in many places, in market trading. Now these activities are being supplemented and, in some cases, supplanted by modern sector employment. In a number of Southeast and East Asian countries, there is a great and increasing amount of women's industrial employment.

In Latin America and the Caribbean, women's labor force participation is increasing especially rapidly in the urban informal sector which, since the early 1980s, has been the fastest growing sector. In Latin America, women outnumber men in rural to urban migration, typically entering the urban informal sector or domestic service. Those who stay in agriculture in the rural areas tend to be involved in the ill-measured low resource sector. The undercounting of the female labor force may be most severe in this region (see, e.g., Wainerman and Reccini de Lattes 1981; Dixon 1982,

FIGURE 1

Relationship Between Women's Industrial Employment and Macroeconomic Growth



1985).[4] While the ideal of the male breadwinner and the female housewife remains, it is decreasingly put into practice.

Economic activity rates for women are lowest in South Asia, North Africa, and the Middle East. In the Islamic countries, in particular, males are expected to fulfill provider obligations. Moreover, women are restricted to a few "acceptable" occupational choices. In these regions, it is usually only the poorest women who perform tasks that are socially stigmatized, such as agricultural day labor and activities involving public contact with male non-relatives. Accordingly, female economic activity tends to be undercounted by both sexes.

In short, there is dramatic regional variation in the extent to which women make measured contributions to the wealth of their nations and are expected to contribute to the support of their families. But, everywhere, women's contributions to national economic growth are more important than pictured in national accounts or perceived by development planners, husbands, or even the women themselves.

In addition to their role in the formal labor force, women in developing countries are universally active in "domestic" activities (such as cooking, looking after family members' health, and fetching water, fuelwood, and fodder) that are not measured in national accounts. **If women's unpaid work in the household were given economic value, it would add an estimated one-third, or four trillion dollars, to the world's annual economic product** (Sivard 1985, 5). But these activities are not considered or measured as "economic" or "productive."

Women also predominate in unpaid activities that clearly are considered "economic," such as subsistence food production and family labor, even though these are inconsistently and incompletely measured in national accounts (see, e.g., Wainerman and Reccini de Lattes 1981 and Anker 1983).

To date, only Goldin's pioneering effort in the United States has quantified women's contribution to their country's national product. Much of the remainder of this monograph pulls together various pieces of evidence that demonstrate women's importance as producers contributing to the wealth of other nations.

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[4] Data collection methodology is apparently more to blame than any attempts by women to hide the fact that they are economically active. See section 4.6.

CHAPTER TWO

The Impact of Women's Production and Control of Income

The causal chains that emerge from women's production, where the resulting income is controlled by women, include consequences ranging from micro to macro levels.[5] Where a woman's production is not unduly constrained or her incentives constricted, the consequences generally are positive for the woman, the well-being of her family, and for more macro development outcomes such as the rate of economic growth in a country or food availability in a region (e.g., Africa). The opposite holds true when she is constrained or denied expected returns to her labor.

This chapter focuses on the consequences of female control of income and the productive activities that generate income under the woman's control. In Chapter 3, we will treat women's importance and effectiveness as producers, as well as the constraints on their productivity.

It should be stressed that mainstream development policymakers and practitioners have seldom considered the control of income by gender as a development variable, because they embrace the neoclassical economics notion of the household. It is seen as an indivisible basic unit of analysis, a "black box" for which a single production function is adequate description (e.g., Becker 1981). From this perspective, it does not matter who brings in the resources, does the work, or spends the money. It is assumed that, within this monolithic household, information and resources are pooled and redistributed equitably. What is not considered is that "income under female control" might be spent differently than "income under male control" or that this could have distinct and significant consequences for women's status within the household and the well-being of its members.

In contrast to this view of the household, this monograph attempts to show that there is an "internal economy" of the household based on age and gender. This is conceptualized as a continuum ranging from domestic units characterized by almost entirely "separate purses" among adult male and female members, to those where women have virtually no income-generating opportunities and are indeed part of a single production function household. Evidence suggests that the unitary household model fits poorly in much of the world. Instead, the "internal economy of the household" model applies and its gender division of information, resources, and labor often have far-reaching consequences for economic development at both the macro and micro levels.

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[5] "Micro" includes individual, household, and local community levels; "macro" levels range from multi-community to the nation and even the region.

Thus the relative male/female control of income is a critically important variable for development. Among the reasons are:

- Women tend to devote a higher proportion of such income to children's nutrition and other family "basic human needs," and hold back a smaller proportion of income under their control for their own personal needs than do men.

- A woman's control of income is often positively related to her say in household decisions on *fertility*, *economic* issues (e.g., production and resource allocation decisions, especially where her own-account activities give her competence in these spheres), and *domestic/family welfare* matters (e.g., which children attend school for how long, health and nutrition-related practices, etc.).

- Relative male/female control of income and other key economic resources appears to be the most important (although not the sole) variable affecting the overall level of gender stratification, that is, women's status vis-a-vis men's (see Blumberg 1984 for the theory and supporting data). This is hypothesized to hold at all levels, from the couple to the nation.

2.1 Women's Use of Income for Food and Children's Welfare

In much of the developing world, women, especially among the poor, have substantial responsibilities as family provisioners. This is particularly the case in female-headed households—a large and growing category in developing countries (Buvinic, Youssef, and Von Elm 1978). Indeed, according to Sivard (1985, 11), "Women are the sole breadwinners in one-fourth to one-third of the families in the world."

Studies show that, where women have any responsibilities as family provisioners, even as "provisioners of last resort," their spending patterns differ from that of men's in two significant ways:

- Women tend to contribute a higher proportion of their income to family subsistence, holding back less for personal consumption.

- Where women have provider responsibilities, it is generally the mother's, rather than the father's, income or food production that is more closely related to children's nutrition. This is not always the case, but evidence presented for Asia, Latin America, and Africa indicates that it is widespread.

The following examples provide evidence of women's use of their income for family welfare:

South India: Mencher studied samples of desperately poor agricultural laborers in 10 villages in Tamil Nadu and 10 more in Kerala. In each state, samples were random in 6 of the 10 villages, and about 48 households were sampled in each village. In India, there is such a loss of status for a woman to do field work for pay that only the poorest do it. But their income is crucial for their family's survival. Mencher's data reveal the following aggregate picture: wives earned a median of 55 percent as much as their mates (mean = 58 percent); wives contributed a median of 94 percent of their earnings (mean = 93 percent) to family subsistence, compared with a median of only 72 percent of earnings contributed by their husbands (mean = 71 percent). Thus, since wives held back so little for themselves, their contributions to family

subsistence amounted to a median of 84 percent (mean = 92 percent) as much as their husbands, even though they earned little more than *half* as much (calculated from Mencher 1988, 108, Table 2A).

Mexico City: Roldan (1982, 1988) studied 140 poor Mexican women who did garment/other industry piecework in their own homes. In 33 of the 53 households selected for intensive study, women and men pooled into a common pot for basic household subsistence expenses. Wives claimed to contribute 100 percent of their earnings, while husbands put in 75 percent or less. Since nearly half the men withheld income information from their wives, which wives resentfully viewed as a control technique to keep them dependent, men may have retained an even higher percentage of their income. Therefore, even though these women earned woefully little, in 11 of these 33 households, their contributions amounted to 40 percent or more of the total common fund. Roldan found that in households where husbands drank heavily, they commonly "borrowed" from the pool. But even so, by earning their own money, the women in all 53 households were freer to spend it for their *own* priorities. And these were clear, as one women noted: "Of course [working for pay] is important because if you earn your own money, you yourself distribute it and you do not have to beg for it. You buy food, or a dress for your daughter, the socks for your son" (Roldan 1988, 245).

Cameroon: Guyer (1980, 1988) studied two Beti farming villages where women grew most of their family's staple crops; they earned some income primarily from petty trade. Their husbands grew cocoa as a cash crop. As in much of Africa, men and women had both separate income streams and separate expenditure responsibilities. Although women farmers earned only about one-third as much as their spouses, "of total cash expenses for food and routine household supplies, women contribute two-thirds and men one-third" (Guyer 1988, 51). Women, it is stressed, provided this in addition to growing their family's main food crops.

The last study emphasizes women's greater earmarking of both subsistence production and cash income for food for their families. This leads us to consider some evidence for our second generalization, the contribution of a mother's income to her children's nutrition:

South India: In Kerala, Kumar (1978) found that mothers with gardens or income had better-nourished children. From an initial stratified random sample of 120 households in three rural villages, she selected a subsample of 48 desperately poor families with children aged 3-36 months; she studied these families for an entire crop cycle. All these people lived "on the edge," that is, they were landless or nearly landless (72 percent owned under one-tenth acre). Her regressions are complex, but show that the single largest contributor to the child's nutrition was the presence of a home garden tended and distributed by the mother. The data also show that there was no positive increase in child nutrition as paternal income rose. But increasing maternal income *did* benefit their children's nutrition. The regressions show that it was resources under the *mother's* control, her home garden, and her earnings (if she worked for wages) that proved most important in accounting for the level of child nutrition.

Belize: Stavrakis and Marshall (1978) studied the effect of the introduction of commercial sugarcane on women's economic roles and family nutrition in a Belize village. Sugarcane generated quite a bit of income, but it was men who controlled and benefited from it ("...money flowed out of the system as fast as it came in, spent on drink, trucks, travel, and purchased female companionship. By and large, it did not benefit the women at home tending the children and animals" (ibid., 158)). Meanwhile, production of corn and other foods declined. Women had depended on corn for food, exchange with kin (a woman's exchange network redistributed corn for past favors and provided food to women whose husbands had a bad crop year), and, most importantly, food for their pigs. Pigs, women's main independent source of income, were fed the 40 percent of the corn that was spoiled or blighted. As a result of this

change in crop emphasis, women's income fell while men's income rose. But, according to a nutrition survey (involving a purposive sample of 59 people in 8 households who were surveyed in both 1973 and 1974), men's higher income did *not* increase the generally poor level of child nutrition. While consumption of healthy foods such as fruits, meats, and fish declined, "consumption of soft drinks and frozen koolaid increased by 255 percent" (ibid., 161).

Rural Philippines: Senauer and associates analyzed 1983-84 longitudinal household survey data for a random sample of about 800 rural households in three Philippine provinces. Among these poor farmers, they discovered that husbands came closest to national recommended daily allowances (RDA) of total calories, with 81 percent; wives averaged 78 percent and children (aged 1-17) averaged only 64 percent. Among children, boys and children born earlier in the birth order got more calories than girls and children born later. Since only 15 percent of women and 55 percent of men in the sample were in the formal labor force, wages were estimated for the rest, using a technique that corrects for the fact that those in the formal labor force are not a random subsample of the population (Heckman 1974, 1979). "The empirical results showed that as the wife's value of time (estimated wage rate) rose, both she and her children did relatively better in terms of the intrahousehold allocation of calories...On the other hand, as the husband's wage rose, both he and his wife did relatively better, whereas the relative intrahousehold allocation of calories to the children declined" (Senauer 1988, 14-15).

In another analysis of the same data, Senauer and associates focused on the nutritional status of preschool children (13-83 months). Only 26 percent of these very poor children had normal height for age; the rest were stunted—23 percent mildly, 27 percent moderately and 24 percent severely. Stunting was significantly more prevalent among children whose fathers had a higher estimated wage, i.e., "The father's wage had a negative impact on his children's long-run nutritional status...[whereas, i]n general, increases in the mother's value of time tended to improve the nutritional status of her preschool children" (ibid, 18).

Southwestern Kenya: Kennedy and Cowgill (1987) researched the nutritional impact of the introduction of commercial sugar into a maize area. They studied three random samples (N = 504): sugarcane farmers (N = 181), nearest-neighbor nonsugar farmers (N = 231), and merchants and the landless (N = 92). Sugar farmers' incomes were significantly higher than nonsugar farmers. But sugar was a "man's crop," and the extra income was devoted to nonfood expenditures (e.g., such male spending obligations as housing and schooling). Women continued to grow the staple crops, so, unlike the situation in Belize, food production didn't fall. With respect to children's nutrition, they found "some evidence that income controlled by women correlates with improved nutritional status, indicating that women are more likely to spend on food and health care;" and that "[c]hildren from households headed by females consistently have better nutritional status than preschoolers from other types of households" (ibid., 10).

Northern Ghana: Tripp (1981) studied the factors associated with good nutrition among a non-random sample of 187 children in a Nankane-speaking farm village. Due to uncertain rainfall and declining soil fertility, cultivation is precarious and the area is marked by both a pre-harvest "hungry season" and periodic food shortages. Tripp found that, given the poor crop conditions, although everyone farms, farming variables were not associated with better nutritional well-being. Rather, it was *trading* income that affected children's nutritional well-being. Tripp notes that:

> Of all the variables tested, the trading activity of the *mother* is the one most significantly associated with the nutritional status of the child. In no case does a woman's trading generate profits that are equivalent to those of the male long-distance traders, but the relatively small amount of money that a female trader earns is translated more directly to the nutrition of her children. The woman has complete control over her earnings, and

> although her trading does not provide her with a lot of money, it does furnish a small steady income which she can use to buy food to augment that provided by the farming activities of herself and her husband (ibid., 19-20, emphasis added).

These examples clearly indicate that the mother's income is more important for child nutrition and welfare (also see Carloni 1984). The implications of the examples are clear. Programs and projects whose objectives or ultimate goals include enhanced nutrition, well-being, and food security cannot target "the household" or "the small farmer" in an undifferentiated manner. **Income and spending changes must be treated and tracked in a gender-disaggregated manner if development goals are to be achieved.**

2.2 Effects of Female Control of Income on Decision-Making

Blood and Wolfe (1960) were the first to establish that a woman employed outside the home had more say in a variety of household decisions than her "housewife" counterparts. Since then, a considerable body of generally supportive empirical evidence has emerged, largely from the U.S. (Blumberg and Coleman 1989 reviews this literature). Here, we will present evidence from several Third World countries on how female-controlled income affects their say in (1) fertility, and (2) economic decisions.

2.2.1 WOMEN'S INCOME AND FERTILITY DECISIONS

Curbing rates of population growth is an important concern in many LDCs and in much of the development community. To deal with this effectively, **key fertility variables must be disaggregated by gender.** For example, women's education generally has a stronger effect on reducing fertility than that of their husbands. Similarly, household or husband's income often increases Third World fertility (United Nations ST/ESA/SER.A/100 1987). But increases in female income generally, though not always,[6] have a negative impact on fertility. A woman's control of cash income seems linked with her relative say in household fertility decisions, i.e., her ability to realize her own perceived utilities (expected costs vs. expected benefits) in a given level and pattern of fertility. Two brief examples will be presented, both from Latin America.

> **Mexico City:** Roldan's study of the women garment/other industry outworkers showed an unmistakable link between the percent of the total household pool contributed by the wife and her leverage in fertility decisions (see Table 1). Note that having more children is a decision made by the woman alone among 50 percent of wives who contribute 40 percent or more of the common fund; in contrast, it is the woman's sole decision among only 20 percent of those providing less than 40 percent and whose husbands are main providers.

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[6] Women's fertility preferences may not always be for fewer children. In many parts of the Third World, especially sub-Saharan Africa, women want—and seemingly *need*—more children than family planners would like them to have, to help fetch water and increasingly scarce firewood and fodder, to help provide for old age, etc.

Guatemala: In 1985, Blumberg followed up a 1980 study by Kusterer, et al. (1981) of the impact of an agribusiness enterprise on people in four research sites: three villages of poor, largely Indian, contract growers, and the mainly Ladina women who worked in the firm's processing plant. The villagers grew broccoli, cauliflower, and snowpeas for the subsidiary of a U.S.-based multinational corporation. The female processing plant workers froze and packed the vegetables for export to the U.S. The firm paid these women the minimum wage. During the 8-9 month "high season," shifts of 12-16 hours a day, 6 days a week, were not uncommon. The result was a wage level as high as an urban male blue collar worker (150 percent-300 percent above female domestics or market traders' earnings). This transformed their lives. The women controlled their earnings and, by 1985, the fertility impact was unmistakable. Among 15 "1980 veterans" in the 1985 sample (median age = 32.5 years) only 13 babies had been born between 1980-1985. These 15 women averaged only 2.2 children each and had taken control of their fertility: 7 said they will not have any more children (at median age = 37, mean = 2.3 children). In contrast, in 1985, 20 women from the only contract grower village with a substantial Ladina population (Patzicia) averaged 5.2 children at median age 33.5. Even though half of these women helped their husbands in the fields, the company's check was for the man. When asked about further fertility, Patzicia women often replied: "I don't want any more but my husband does so I'll have to continue" (Blumberg 1985, 1989a).

Table 1: Effect of Wife's Contribution to Household "Pool" on Her Fertility Leverage

Wife's contribution to "pool"	Use of contraceptives	Have more children
1. >40% (N = 11)		
wife's decision	50%	50%
joint decision	40%	40%
2. <40% (N = 19)		
wife's decision	40%	20%
joint decision	53%	68%

Source: Compiled from Roldan (1982, 1988); missing percent = inferred to be husbands' sole decision.

In summary, an increase or decrease of income in the hands of the woman can be expected to have more direct consequences for family fertility.

But aggregated family fertility decisions constitute a country's total fertility rate. And new evidence shows that a falling fertility rate strikingly improves a nation's development prospects. In particular, Hess (forthcoming) provides strong evidence, from multivariate regressions of a 49-country sample over two time periods covering the 1960's and 1970's, "that reducing fertility

contributes to economic growth in contemporary LDCs" (ibid., 174). Moreover, the positive impact of lower fertility on national economic growth increases with time and with socioeconomic development. His two-stage least squares (2SLS) regression estimates for the response of the percentage change in real per capita GDP to the percentage change in the national total fertility rate increase from -1.20 to -1.35 between the first and second time periods. Hess uses infant mortality as the proxy for socioeconomic development and finds an even stronger impact: the 2SLS estimates go from -1.26 in his high infant mortality subsample (corresponding to the least developed countries) to -1.67 in his low infant mortality subsample. We will return to the link between women's condition, fertility, and national growth in the discussion of women's education (in Chapter 4).

2.2.2 WOMEN'S INCOME AND ECONOMIC DECISIONS

Nepal: Acharya and Bennett (1981, 1982, 1983) studied 279 households in eight villages, linking male/female economic contributions to their input on household decisions. These they describe as "truly subsistence households, consuming more than 86 percent of what they produce" and getting only 30.6 percent of total income through market intervention (1983, 8). But it is the extent to which women derive income from the market economy that "gives them much greater power within the household in terms of their input in all aspects of household decision-making. [Conversely], confining women's work to the domestic and subsistence sectors reduces their power vis-a-vis men in the household" (1983, ix). For example, their regression results show that a woman's involvement in short-term employment or trading outside the village has a significant, positive impact on her decision-making power over the household's most important resource allocation decisions (e.g., to buy or sell land or large animals). At the same time, greater involvement in domestic activities has a significant, negative effect on her input into those major resource decisions (1983, 39).

Guatemala: Santiago Sacatepequez, one of the three largely Indian villages first studied by Kusterer, et al. (1981) and then by Blumberg (1985) was unique in several ways. These included: (1) a co-op which had a master contract with the agribusiness firm, (2) the long involvement of its women in horticultural field work, and (3) the co-op's cash payments, given to either men or women (with a receipt). Between the 1980 and 1985 studies, the third feature changed in a manner that greatly affected household decision-making. Traditionally women spent three days a week as own-account market traders in the capital and three days a week in the family fields. But the greater labor intensiveness of the contract crops left them with less time to do their trading. In 1980, this did not adversely affect their household position but, in 1984, the co-op switched to checks payable solely to the official member (the husband, with the exception of a handful of widows). In 1985, a purposive sample of 17 women complained that they had less voice in all kinds of decisions. Before, their own-account food crop trading, in Guatemala City's large Terminal Market, gave them expertise in prices of different commodities as well as the leverage provided by their own income. Their husbands used to listen seriously to their recommendations of how much to plant of which crops. By 1985, their opinions were little heeded. Their husbands opted to plant more land in the contract crops for which men received the income. At the same time, the women worked harder but had less autonomy and less money.

A number of staff members at the co-op worried about the consequences of what they saw as a clear and rapid drop in women's autonomy and leverage. They noted that income was rising with the co-op's success, and that the men were acquiring transport vehicles and, sometimes,

more land. But they did not see a corresponding increase in expenditures affecting children's welfare, especially nutrition. They feared that, with women's decreased status and more limited access to income, family well-being was not keeping pace (Blumberg 1985, 1989a).

This last example demonstrates the negative consequences of decreasing female control of income. In the case of the women of Santiago Sacatepequez, the negative impact of less access to income emerged very quickly. Elsewhere I have hypothesized that, in general, a woman's position can fall more quickly and directly with a drop in her independently controlled economic resources than it may rise when income under her control increases (Blumberg 1984).[7] Having less access to income may reduce women's decision-making input in everything from planting crops to purchasing foods (section 2.4.2 gives still another example—from the Kenyan Mwea resettlement scheme). When a woman has less money, even if her husband's income goes up and family income is not hurt, the composition of household spending is likely to tilt away from her preferences and she will have less income with which to redress the balance. This could mean lower proportionate spending on children's nutrition, education, and health.

2.3 Women as Providers: Their Response to Incentives

Although there is marked regional/cultural variation, where women have provider responsibilities, we can hypothesize that:

1. Women will tend to allocate their labor toward activities that put income and/or food under their direct control and, where culturally feasible, they will attempt to allocate their labor away from activities that do not, even if the latter are more profitable.

2. The farther down one goes within an economic sector the higher the proportion of women, especially in the least measured activities such as low resource farming, informal sector trade, and other microenterprise.

3. The poorer the household within an economic sector, the higher the proportion of their family's subsistence that these women's economic activities provide.[8]

4. Poorer women with provider responsibilities may be more responsive than their male counterparts to either easing of constraints on their production, or new incentives for production.

Thus far we have focused on micro level consequences of women's self-generated economic resources, with only passing mention of more macro level effects. Now we will examine evidence for the first and fourth hypotheses (Blumberg 1989b treats the second and third hypotheses). Our emphasis is on macro level consequences, including the African food crisis.

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[7] For more detailed discussion of my general theory of gender stratification, see Blumberg (1984).

[8] Many of the developing world's female-headed households are found at these levels.

2.4 Ways Development Suffers When Women's Returns to Labor Are Ignored

The following African examples illustrate the first hypothesis—that women will try to allocate labor toward activities under their own control and away from activities that are not, even when the latter are more profitable. All the examples involve planned development projects that introduced an intervention which increased women's work load while giving the returns to their husbands. In terms of the prevailing development view of the household as a monolithic pooling unit, this should have created no problems. The facts show otherwise. It is no accident that all the examples are from rural Africa. First, it is here that many studies have found that husbands and wives are *most* likely to maintain "separate purses" for most expenditures. Many structural factors encourage them to do so. Among these are continued high rates of polygyny and, in many instances, marital instability (see Staudt 1987). There is also the fact that women are, with some exceptions, very economically active. They raise as much as 80 percent of the locally consumed and marketed food crops (Sivard 1985, 5) and, especially in West Africa, are frequently active in own-account petty trading. In addition, both genders typically have separate expenditure obligations, not only vis-a-vis their own children and household, but also with respect to their natal kin.[9]

Second, despite African women's importance in the farming system, agricultural projects typically bypass or undercut them in the allocation of extension, inputs (fertilizer, seeds, etc.) and credit. Women farmers are also ignored in most non-African countries but almost nowhere else is there such a wide gap between women's importance in cultivation and their incorporation into agricultural development schemes. Much of the bypassing of women farmers can be attributed to the often mistaken assumption that any aid or information that reaches the (male) head of household will be redistributed internally.[10] In addition, the "gender-neutral" approach of the typical agricultural development project actually results in "gender blindness" to women's productive activities and the returns that they get from their labor.

Third, the net result of such development efforts in Africa is often an increase in a woman's workload, coupled with an erosion of the resource base from which she must generate food and/or

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[9] Especially where polygyny or marital instability are high, a woman has a strong need to keep up her ties with natal extended kin. In order to do so, she must uphold her end of traditional obligations and giving.

[10] This assumption is linked to the monolithic, "black box" view of the household. But Fortmann (1982), who has done field research in Tanzania and other African countries, found that husband-to-wife communication of extension messages was ineffective. Koons (1988) found the same in Cameroon. An Asian example is provided by the Northeast Rainfed Agricultural Development project in Thailand. Men were trained to carry out crop trials. But the men were not full-time farmers. Because the wives received no training, "crops were planted incorrectly and did not grow, the power tillers provided by the project could not be used, and a nitrogen-fixing crop intended to fertilize rice did not get planted. *Even when the husband was present, advice on crop production was incorrectly transmitted from husband to wife*" (Carloni, 1987, 16, emphasis added, reporting on Blanc-Szanton, Viveros-Long and Suphanchainat, 1987).

income.[11] Women are left to raise the bulk of locally grown food crops with little assistance and worsening factor endowments.

2.4.1 THE CAMEROON SEMRY I IRRIGATED RICE PROJECT

Jones' (1983) sophisticated econometric analysis of this project provides a strong case for the first hypothesis. Women's own returns to labor strongly affected how much rice they grew. Jones' study also provides a richly documented case of how a development project suffers when women are not given sufficient compensation for their labor. Her data (based on a random sample of 102 Massa women from three villages) demonstrate three key findings:

1. The project's long-term prospects are in doubt—since it has not been able to get farmers to grow enough rice to provide revenues for both operating costs and amortization. Although SEMRY I encompasses about 5,400 hectares of pump-irrigated rice fields, and both yields and prices have been good:

> Every year many fields go uncultivated for lack of farmer interest...In the 1981 rainy season...only 3,228 hectares were cultivated, despite [a 45 percent] increase in the producer price in 1980 (ibid., 30).

To understand why SEMRY cannot find takers for its idle fields, we must examine who works in contrast to who benefits.

2. Women with more incentive raised more rice. Cultivating rice on irrigated SEMRY fields was a joint conjugal activity but the husband received all the income. He then compensated his wife as he saw fit.

> In return for [her] sweat, a woman receives about 7,700 CFA [French African francs] and about 9,200 CFA worth of paddy from her husband after the harvest, or about 16,900 CFA in total. This is less than a quarter of the net returns from rice production—about 70,000 CFA. Valued at the market wage rates...a woman's labor contribution is worth about 31,200 CFA, so her husband makes a profit of about 14,300 CFA from her labor (ibid., 51).

Husbands were very aware that their wives' continued participation depended on their own generosity (i.e., the "wages" they gave them). Although wives had to raise *some* rice or risk a beating, wives' rice labor—especially during transplanting season—competed directly with women's sorghum production and other income-generating activities. In fact, one of Jones' regressions shows that, during the peak season for rice transplanting, women had to make a one-to-one trade-off between the number of days they work on rice vs. sorghum planting and weeding:

$$\text{Days Rice} = 28.57 - 1.04 \text{ Days Sorghum}; \; R^2 = 0.77; \; F = 30.93.$$

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[11] This unexpected negative effect of planned development projects was first documented by the Danish economist Ester Boserup. While it occurs beyond Africa, her data emphasize sub-Saharan "female farming" systems (Boserup 1970).

Married women had good reason to prefer to work on sorghum, which was cultivated on an individual basis by both women and men in 100 percent of project households. Although a married woman used her sorghum primarily for feeding her family, it was her *own* sorghum. Not surprisingly then, another of Jones' regressions establishes a very strong "relationship between the amount of compensation women receive from their husbands and the number of days they worked on their husbands' rice fields" ($R^2 = 0.70$). Yet rice gives the better return (ibid., 52).

So we find that the few independent women, mostly widows, who grew rice on their *own* account spent 24.7 days transplanting it. In contrast, married women spent only 16.4 days transplanting their husbands' rice, a significant difference. The rest of the time they worked on their own sorghum. In net result, households of independent women transplanted .47 hectare per adult worker in contrast with only .31 hectare transplanted by married women.

3. Women with more incentives cultivated twice as much land in rice. There was no difference in rice yields between independent and married women. Both obtained about 4,300 kilos/hectare. The difference was in amount of land cultivated in rice. The independent women and those married women who received a significantly higher rate of compensation from their husbands cultivated about double the land. Jones compared independent women with two groups of married women—those whose households grew more than .75 *piquet* (1 *piquet* = .5 hectare) per household worker and those whose households grew less. The independent women averaged .94 *piquet* per household worker. Households cultivating .75+ *piquet* per household worker averaged an almost identical .95 *piquet*. Households cultivating less than .75 piquet averaged only half as much (.47). The secret? Married "women who cultivated .75 *piquet* or more per household worker were compensated at the mean rate of 363 CFA/day, while the married women who cultivated less than .75 piquet per household worker received only 302 CFA/day from their husbands" (ibid., 133). The difference is significant, as is the result, regardless of the direction of causation.

In summary, although wives were compensated above opportunity costs to work on their husbands' rice, that payment depended on the husband's uncertain proclivities at the time of the harvest. Given the competition with sorghum, over which women had direct control, few women had enough incentive to spend less time on sorghum in order to "take on the cultivation of an additional rice field" (ibid., 83). And so many of SEMRY's irrigated fields still go untilled.

2.4.2 OTHER EXAMPLES FROM AFRICA

Kenya—Pyrethrum Project: In an area where Kenyan women traditionally grew pyrethrum (used in insecticide), sold the dried flowers, and kept the income, a project organized a co-op to exploit this crop. The co-op gave payments only to formal members who were mainly men. The disgruntled women reduced their output (Apthorpe 1971).

Kenya—Mwea Resettlement Scheme: Project management failed to provide women with enough land to grow their own food crops although women previously had been the chief

cultivators in their home villages. Instead, the project necessitated their working long hours on their husbands' irrigated rice. Earnings from rice, the only project crop, were paid solely to the husband. Many women deserted their husbands. Many others held back rice from the harvest and processed and sold it on the black market. Male drunkenness rose as women turned to beer-brewing for income. All in all, **household income rose but nutritional levels fell as women became very dependent on their husbands for household expenditures.** In comparison with a nearby off-project village (where women farmed their own plots, supplied much of the family food and traded the surplus on their own account), Mwea women had considerably less say in family decision-making (Hanger and Moris 1973).

Kenya—Turkana Irrigation Project: Traditionally, Turkana men had been herders and women had been the cultivators, who controlled the produce from their rainfed sorghum plots. The project counted on women providing unpaid labor for their husbands' irrigated crops but paid all cash earnings solely to the male household head. So women neglected the irrigated project crops for their *own* off-project rainfed sorghum. As in Jones' Cameroon SEMRY I study, the few women with their own irrigated plots spent less time on sorghum. Output on the one-acre irrigated plots was so low, women had to work on off-project activities for their family to survive. Their children's nutrition was found to be the worst in the area—even lower than in famine relief camps receiving food rations. Male drunkenness rose as women brewed and sold more sorghum beer in an attempt to fill their provider role (Broch-Due 1983).

The Gambia—Irrigated Rice: A project developed by male Taiwanese technicians was targeted to men, even though women were the traditional cultivators and income beneficiaries of swamp rice. In order to assure women's labor on irrigated rice, men blocked women from owning and/or cultivating irrigated rice on their own account. As a result, rice production *decreased* under the project as women held back their labor (Dey 1981, 1982).

In all of these examples, to the extent they were culturally able, women tended to allocate their labor *away* from an activity under their husband's control and *toward* one from which they could directly reap food and/or income, even if the former brought a higher rate of return. In short, incentives for "the household" don't elicit as much of a response from women farmers as incentives under their own control.

Let us now turn to a positive example that illuminates the fourth hypothesis, that women with urgent provider responsibilities might be more responsive than their male counterparts to either the easing of constraints on their production, or the emergence of new incentives. It is relevant that females are poorer. Women almost invariably earn considerably less than men, hence their opportunity costs are lower. Therefore, so long as the cash generated is under their control, women may more zealously go after even a modest increase in cash than their male counterparts.

2.5 Male/Female Farmers' Responses to a New Road in Cameroon

Henn (1988), an economist, studied two Beti villages (Bilik Bindik and Mgbaba) in the cocoa-growing region of Southern Cameroon. She found that, even though they already were working over 60 hours a week, women were more responsive to improved marketing conditions and rising

prices for food crops than men, who worked only half as many hours. Henn's random samples involved 40 households (21 in one village and 19 in the other).[12]

A major new road opened in 1982, which greatly improved marketing access for the village of Bilik Bindik. Farmgate prices also rose. Meanwhile, Mgbaba remained quite isolated. Henn found that both men and women in Bilik Bindik increased their output of marketed food, but women's response was much greater:

> Women in Bilik Bindik reported increasing their food production and processing labor after the road opened...[spending] 4.6 more hours a week producing food than women in market-isolated Mgbaba. Women's total work week was nearly sixty-eight hours in Bilik Bindik vs. sixty-one hours in Mgbaba...[a difference] significant at the 10 percent confidence level. Women in Mgbaba worked less than five hours a week producing food for the market while women in Bilik Bindik spend 10.75 hours. The effects of the additional labor on women's incomes, enhanced by the lower marketing costs in Bilik Bindik were dramatic: women from Bilik Bindik made an average net income of $570 from sales of processed and unprocessed food, while women from Mgbaba made only $225 (ibid., 323).

The contrast with men is sharp. Men's main source of income was cocoa. Only 24 percent of the men sold food crops, in contrast to 94 percent of the women. But this small group of men received an exceptionally high rate of return (an average of $3.80 per hour) for their production of plantains and bananas, the only two food crops grown by males. In contrast, cocoa brought them an average of $1.70 per hour for the 1984 crop. Women received only $0.71 per hour for food crops grown on their own account (including peanuts, corn, melons, leafy vegetables, onions, tomatoes, cassava, plantains, bananas and cocoyams).

The Bilik Bindik men devoted nearly one hour per week to increased plantain and, especially, banana production in contrast to the Mgbaba men's average of only twenty minutes labor per week on these highly perishable food crops (which were difficult to transport from Mgbaba to the market without spoilage). At the same time, the men in Bilik Bindik:

> ...cut back on the amount of time they spent helping their wives produce food for the family. Women in Bilik Bindik, therefore, were obliged to make up for disappearing male labor in the subsistence sector (ibid., 324).

Given the small male sample size, these data must be seen as merely preliminary. But it seems that men, despite an average work week of under 32 hours, proved less responsive than women, working twice those hours, to fairly lucrative new income opportunities for marketing food crops.

The women, with a crushing work schedule double that of the men, described themselves as overworked. The women devoted 26 hours/week to agriculture and 31 to "domestic" activities, vs. their husbands' 12 hours/week in agriculture and 4 in "domestic" tasks. For both genders, the

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[12] She surveyed each married adult in both villages. In Bilik Bindik, this involved 21 households representing 23% of total households. In the second village, Mgbaba, her 19 households represented 17% of the village total. She studied 34 men and 47 women. There were more women due to polygyny.

remaining work time was devoted to other income-producing activities. Clearly, the women's additional labor was approaching physiological limits. Moreover, they ran the risk that their husbands would shift more of the burden of family maintenance costs onto women as female income rose—a pattern that was occurring, according to Henn's inference from cross-sectional data. The women's response speaks for itself. Their need for income was so strong that it outweighed the constraints of a daunting labor burden.

In light of both African women's importance as own-account food crop cultivators and the seriousness of the African food crisis, it should be of critical policy importance that these African women farmers, more than men, seem more willing to grow additional own-account food crops for the market when their constraints are eased and farmgate prices rise. Thus far, however, the limitations of the "black box model of the household" seem to have prevented policy makers from recognizing that gender is a crucially important variable vis-a-vis African food production.

2.6 Neglect of Women Farmers' Micro Level Incentives: Implications for the African Food Crisis

The next portion of the monograph links micro (individual farmers) and macro (the African food crisis) levels. It is proposed that lack of attention to women producers and their returns to labor is an important but neglected cause of the region's persistent food shortfalls.

Television now shows us the endstage of the African food crisis—periodic famine. This is usually traced to such immediate precipitating causes as severe drought and/or war. But the overall statistics are grim even in non-famine years:

- According to FAO, the sub-Saharan food supply grew about 1.6 percent per annum during the period 1970-1979, while population grew between 2 and 3.5 percent. More recent FAO figures indicate that the situation has deteriorated further since then (Raikes 1986, 162).

- Food production per capita has fallen over the last decade by up to 15 percent in some countries and by 6 percent over the whole of the [sub-Saharan Africa] region. Cereal imports have risen by 117 percent and food aid by 172 percent (World Bank 1985, Annex Table 6, quoted in Lawrence 1986, 1).

- According to a recent African survey (ECA 1983, pp. 8-9)...Food self-sufficiency ratios dropped from 98 percent in the 1960s to approximately 86 percent in 1980. This means that, on average, each African had about 12 percent less home-grown food in 1980 than 20 years earlier (Hyden 1986, 11).

It would seem reasonable to suppose that learned discussions of the African food crisis would at least acknowledge women's crucial and well-documented role as producers of up to 80 percent of the locally consumed/marketed food (e.g., Sivard 1985, 5, 17). But a look at two of the most recent such analyses, Mellor, Delgado, and Blackie 1987 (in the "mainstream" development

paradigm), and *World Recession and the Food Crisis in Africa*, edited by Lawrence 1986 (in the more radical paradigm) shows that this is not the case.

Their discussions of the causes of the recent African food shortfalls are complex and cite many factors. One finds many references to "peasants" and "producers" but little awareness of the division of labor and resources by gender. Nor is there more than an occasional mention of the gender of those growing most of the food and doing most of the farm work. Yet, according to the Economic Commission for Africa (ECA), females account for 60-80 percent of all labor in agriculture (United Nations 1978, 5).

They are not alone. Despite the empirical reality of the gender division of labor in most African cultivation, "African farmers" are usually thought of as men, or as households headed by men and united in a common enterprise. The practices of colonialism, overlaid by several decades of post-independence development assistance, have created an almost entirely male-oriented approach to farming in most African countries that ignores the importance of female producers. Schools of agriculture have overwhelmingly male enrollments and the few females are concentrated in traditional home economics. In 1986, research in Nigeria found enrollments to be well over 90 percent male, even counting home economics students, in three major Nigerian universities' faculties of agriculture (Gamble et al. 1988). An estimated 97 percent of all extension agents in Africa are male (Swanson and Rassi 1981). And, in most countries, the targets of their assistance also are almost always male, although this is starting to change in a few places, such as Kenya, Malawi, and Nigeria.

Elsewhere (Blumberg 1989b), I have argued that one reason for this virtually all-male orientation is that most of the colonialists and the current development experts have come from or were trained in Western countries with an agrarian[13] farming system. The ethnographic data base amply documents that agrarian farming systems are predominantly male-based (see, e.g., Murdock 1967). But much, albeit not all, of Africa is horticultural.[14] And here the ethnographic data base documents that male-based farming systems are a distinct minority: of 376 horticultural societies included in Murdock's (1967) 1170-society *Ethnographic Atlas*, in only about one-fifth were men the predominant cultivators.

Even more invisible than the gender division of labor in African cultivation is the gender division of resources. As noted, the unitary household model obscures the reality of men and

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[13] "Agrarian" refers to a plow-based farming system that typically involves "mixed farming" (i.e., a combination of crops and animals, often using animal-drawn traction and animal dung as fertilizer). It can be rainfed or irrigated and is often well-suited to mechanization. Agrarian cultivation, however, requires soils deep enough to take the plow. This is often *not* the case in sub-Saharan Africa, where horticultural cultivation remains dominant.

[14] "Horticultural" cultivation generally involves use of the hoe, and slash-and-burn techniques. In much of sub-Saharan Africa, typically poor tropical soils—thin, acidic, easily leached—predominate, making a transition to mechanized agrarian cultivation impossible.

women's separate provider obligations, income streams, and expenditure patterns as well as the prevalence of at least partially "separate purses," rather than pooling in a common household fund. Consequently, development policy and practice have been largely blind to the possibility of gender-disaggregated incentives.

Gender-disaggregated incentives and "separate purses" may be particularly important in sub-Saharan Africa because of three fairly unique regional characteristics: (1) the continued high prevalence of polygyny[15] which ranged from 30 to 47 percent in most of the nine sub-Saharan countries included in the World Fertility Study sample (see United Nations ST/ESA/SER.A/100 1987, 324); (2) the overwhelmingly patrilineal, patrilocal[16] basis of its kinship system, and; (3) women's importance as farmers.

In such a system, additional wives increase the resources of a man. A woman has a marital obligation to labor on her husband's fields and/or crops. She also may be allowed to intercrop own-account crops in the husband's plots on which she is required to work. Typically, she also receives use rights to plots on which she raises crops for family provisioning and own-account sale of surplus. Her access to land is tenuous. Her use rights to a plot remain in force only so long as the plot remains in production. Women generally are assigned poorer, more marginal land in the first place (Norem 1988). They may try to keep it in production longer than they should because obtaining new land and/or getting (male) assistance in clearing it is increasingly problematic (Cashman 1988). This is due to present trends toward population pressure and land scarcity, environmental degradation,[17] and increasing rural male rates of school attendance and outmigration.

The patrilineal, horticultural, and, often, polygynous system puts a premium on maintenance of at least partially "separate purses." How much goes into "his, hers, and theirs" varies. Polygyny typically means separate purses for co-wives. Co-wives may share domestic labor, but almost always maintain entirely separate economic endeavors and accounts. In a number of ethnic groups, men and women may pool expenditures for certain items such as children's school fees. But in many groups, the woman has the obligation to provide part or all the food, or income to purchase it, for her children. Furthermore, it is very important for her to maintain ties with her natal kin,

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[15] Polygyny (where a man marries more than one wife) in Africa generally requires that the groom pay a brideprice. Therefore, poorer and younger men are less likely to have plural wives.

[16] Patrilineal means that descent is reckoned through the male line and that there is a corporate kin group composed of the descendants of a particular male. Patrilocal means that the young couple traditionally go to live in the village of the groom's male (patrilineal) kin.

[17] If thin tropical soils are not allowed to regenerate (i.e., be put in long, or "bush" fallow) after several seasons of cultivation, ecological degradation results. Rising population pressure in most of Africa has a strongly negative impact on the amount of time land is kept in production vs. fallow. Population pressure is intensifying because Africa has the world's highest rate of population growth—still over 3% per year, based on the world's highest birth rate (49 per 1,000 according to data in Sutcliffe 1986, p. 21).

especially in groups with high marital instability. This entails fulfilling certain financial and ceremonial obligations to her own extended kin.

As a result of all these factors, most women *must* have some income of their own, in order to fulfill their provider and natal kin obligations. This explains why the women, in the examples discussed earlier, actively attempted to allocate their labor toward activities which put cash and/or food under their control, and away from activities with more indirect returns, even if these provided a higher rate of return. Conversely, this is why they did not respond as passive members of unitary households.

Thus, African women farmers' need for income and their lower opportunity costs appear to make them more responsive to a reduction of constraints and an increase in prices, as occurred in Henn's study of the Cameroon villages that did and did not get a new road.[18]

As such, African women farmers should be—but are not—natural targets for agricultural programs and projects based on the new emphasis on "structural adjustment." One of the major aims of the World Bank's structural adjustment programs is "getting the prices right" (World Bank 1981). This involves changing a country's macroeconomic policies to reduce government interference in markets and "correct" urban-based factor prices. The rationale for these policies is that, in addition to thereby increasing "tradeables," especially for export, the resulting higher agricultural prices will provide incentives for small-scale food producers. At the same time, it is acknowledged that these policies bring immediate hardship to the urban poor, for whom prices of basic necessities typically skyrocket (see, e.g., Longhurst et al. 1987).

In many African countries, 98 percent of local food output is generated by small scale producers. Estimates show African women producing up to 80 percent or even 90 percent of locally grown food (Sivard 1985, 5, 17). We have already seen that at least part of this food production is typically grown by women farmers *on their own account.*

While much of female farmers' food is used for family provisioning, the urgent income needs that drive what Vellenga (1983) terms women's "persistent search for profit" push them to market a considerable portion of what they raise on their own account, wherever it is feasible and rewarding. For example, a Nigerian survey (Adeyokennu, 1981), based on a non-random sample of women in three villages representing the country's three major geographic/ethnic areas, found considerable dedication to the market (see Table 2).

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[18] Even so, there are limits to how much women can be expected to respond to lowered marketing constraints, increased access to extension, fertilizer and credit, and even increased prices if they are laboring from dawn to dusk. Time budget studies invariably show longer total workdays for Third World women than men (Sivard, 1985). Much of it is due to such necessary but largely invisible work as fetching water, fodder and fuel—and cooking with that fuel by inefficient, low technology forms of combustion. Chapter 3 shows what happens when women's drudgework in such activities is reduced.

Table 2: Marketable Surplus as Percent of Crops Grown

Percent of Crops	North (N = 32)	West (N = 35)	East (N = 73)	All (N = 140)
0-10	-	-	-	-
10-20	-	-	0.95	0.88
20-40	10.00	33.33	15.24	18.67
40-60	80.00	22.00	17.14	37.79
60 +	10.00	44.67	66.67	42.66

Source: Adeyokennu 1981, 20, Table 10.

The proportion of women's marketable surplus found in this Nigerian study may or may not be higher than elsewhere in Africa; data are sparse. The implication of the Henn study, discussed earlier, is that where women benefit from increased incentives or reduced constraints, they would bring *more* of their food crops to market, over and above whatever they currently were selling.

But if development initiatives target the household as an indivisible unit, and thereby direct income and incentives to the male head regardless of whose labor and traditionally controlled income is involved, much of the structural adjustment rise in food prices may result in hardship for the urban poor without eliciting the hoped for increase in local food production. In other words, even the "rightest" of prices won't matter if women producers of the bulk of the food crops don't get enough of the resulting income to provide incentive.

And yet, African women farmers still rarely are targets for agricultural assistance of any sort and almost never are considered in terms of incentives. At minimum, this is an inefficient use of scarce development resources. At maximum, this would seem to be an important—albeit unheralded—factor in the African food crisis. Alternatively stated, we could argue that African women farmers must be explicitly targeted, because otherwise they don't automatically get either the information or the incentives to enhance their production. **Given incentives, women could be the single most cost-effective available resource to alleviate the African food crisis** (Grosz 1988).

CHAPTER THREE

Women Producers' Contributions and Constraints

This portion of the monograph highlights women producers' importance, effectiveness, and constraints in low resource farming and urban informal sector microenterprises. These activities are incompletely included in measured labor force participation. African women traders are the focus of a final case study of a sector in which women are often important and effective—yet the targets of special constraints that reduce their ability to distribute food.

3.1 Women's Importance as Producers

3.1.1 FOOD AND AGRICULTURAL LABOR

According to Sivard's estimate (1985, 5): "Rural women account for more than half the food produced in the Third World; for as much as 80 percent of the food production in Africa." The older, regional estimates for women's full contributions to agricultural labor were: 60-80 percent in Africa, 60-80 percent in Asia, and 40 percent in Latin America (see United Nations 1978).[19]

3.1.2 THE INFORMAL SECTOR

With the growth of the informal sector's size, importance, and popularity as a locus for development projects, data are starting to become available. Cornia et. al. (1987) argue that the informal sector may well be the main source of employment in developing countries and its importance in this respect has been increasing during the past 10 years. It should be noted that most of the gender data on this sector are estimates. Berger (1985) reckons that the informal sector absorbs 40-70 percent of those working in the cities of the developing world, with women predominating. In Latin America, Berger and Buvinic (1988) calculate that women may account for half or more of those active in the sector.

3.2 Women's Effectiveness as Producers

3.2.1 WOMEN FARMERS' PERFORMANCE

Data are scarce on relative productivity of males vs. females in low resource farming. The classic study remains that of Moock (1973; 1976) who measured maize output in a sample of 152 Kenyan farmers (51 of them female household heads). According to his regressions, controlling for

[19] This is based on estimates from the United Nations regional economic commissions—the Economic Commission for Africa, ECA, the Economic and Social Commission for Asia and the Pacific, ESCAP and the Economic Commission for Latin America, ECLA. The estimates were aggregated from microlevel studies that examined the full farming system, not just the measured agricultural labor force.

physical inputs and natural factors, women were technically more efficient maize farmers than were men. The b coefficient indicates that "a woman obtains 6.6 percent more output at the mean levels of input use than does a man" (Moock 1976, 833).

The problem is that "the playing field is not level." Women have less schooling and farm with lower technology, fewer (if any) commercial inputs, less access to credit and extension, and, quite often, on more marginal soils. For example, Moock found that women farm managers had significantly less schooling and extension contact than men ($r = -0.31$ and -0.24, respectively, $N = 160$, $p < .001$). Women also had strikingly fewer purchased inputs (e.g., for nitrogen use, $r = -0.21$, $N = 160$, $p < .005$). Controlling for these differences, he found:

> As anticipated, although this result may come as a surprise to many officials responsible for policy for this area, the women in Vihiga are better farm managers on average than are the men. In fact, [the linear] equation suggests that a woman produces an additional bag and a half of maize with a given package of physical inputs (Moock 1973, 1973).

Table 3: Factors Influencing Maize Yields/Acre

Variable	Linear Equation	Curvilinear Eq.
Constant	0.540	0.695
Interplanted maize/beans	1.708++	0.083+
Hybrid maize seeds	1.437+	0.062
Maize plant population	1.085+++	0.612+++
Insecticide	0.928	0.066
Rate of phosphate	0.031+	0.047+++
Rate of nitrogen	0.081+++	0.064+++
Fallow/fertilize last season	2.181+++	0.079++
Person hours/acre	0.0017++	0.062
Hail damage	-0.961++	-0.048++
Misc. (erosion) damage	-1.961+++	-0.133+++
Schooling	1.244++	0.067+
Extension index	0.0027	0.010
Project loan	0.537	-0.055
Migration/age	0.864	-0.0013
Female manager	**1.508++**	**0.080++**
R^2	0.642	0.663
F	16.279+++	17.810+++

Source: Moock 1973, adapted from Table VI.4, p. 198. (+, ++, and +++ indicate levels of significance of .10, .05, and .01 respectively. The dependent variable is maize yields in bags/acre; mean = 17.6 bags/acre—17.8 for men and 17.1 for women—with minimum = 5 and maximum = 33 bags/acre, std. deviation = 5.7.)

By holding constant most of the factors of which women usually have less (from fertile soil to credit to commercial fertilizer, etc.), through multivariate regression analysis, we obtain deeper insight into women's intrinsic abilities as farm managers. The bivariate relationship between gender and yields (i.e., with no controls for all the factors of which women usually have less) indicated that women got somewhat lower output. Even though the multivariate analysis showed women's better performance with a "statistically leveled playing field," in real life, women's lower factor endowments often mean lower yields.

Two other studies provide corroborative evidence on women's basic competence as farmers: Staudt (1975-76, 1978) on Kenya and Fortmann (1978) on Tanzania.

Kenya: Staudt found that women managed 40 percent of farms in her Western Kenya research zone, reflecting high rates of male outmigration. In one area with minimal agricultural input services such as extension and credit, the most prevalent situation facing the world's small farmers, she found that women managers were earlier adopters of maize and grew a more diversified set of crops. But in another area where the level of agricultural input services was much higher, long-standing, and aimed largely at men, women lagged behind men in speed of adoption and crop diversification.

Tanzania: Fortmann studied *Ujamaa* villages and found that women were using improved farming techniques. There were no significant gender differences in scores indicating "good maize practices" within groups of purchasers and non-purchasers of improved inputs (seeds, fertilizers, pesticides, and herbicides). The relative gender composition of the purchasers and non-purchasers of the improved inputs is not given. However, considering women's much lower access to cash income, it is a reasonable inference that the men considerably outspent them. To the extent that these purchased inputs enhanced yields, women's output presumably lagged behind, "good maize practices" notwithstanding.

These studies, demonstrating women's effectiveness and competence as farmers, indicate that they perform as well as (and in several cases, better than) their male counterparts once males' greater access to education, extension, and other production aids is controlled. Otherwise, given lower access to these boons, and their smaller, poorer land endowments, women's production tends to lag behind.

3.2.2 WOMEN MICROENTREPRENEURS' PERFORMANCE

Although most discussions of the effectiveness of women vs. men in the informal sector involve speculation or, at best, estimates, there is one exception where empirical data on relative male/female performance are increasingly becoming available. Microenterprise credit projects have been proliferating in the Third World in recent years. Lycette's review (1984) shows that women have done as well as or better than men in terms of loan performance. More recent case studies, such as the following Latin American examples, support her findings.

Dominican Republic: In the ADEMI microenterprise project, two types of loans were given: (1) a bottom stratum of street vendors, recyclers, etc. received "Solidarity Group" loans; 43 percent of this group was female in 1985; (2) those with some means of

production and perhaps an assistant or two received individual loans; in 1985, 17 percent of these microentrepreneurs (MEs) were women. Women in both strata performed as well as or better than men on loan repayment. Also, women MEs created slightly more jobs than men MEs: 1.5 vs. 1.3. In particular, the women MEs of the clothing/textiles sector merit special mention. The single most prevalent economic activity among ME loan clients was clothing/textiles, accounting for 150/847 ME loans. This sector also accounted for about half of all female ME loan clients. These women MEs had a rate of employment generation twice as high as their male counterparts (1.4 vs. .64 new jobs created). In fact, their clothing/textiles businesses were growing faster than those of their male counterparts on five of six computerized monitoring indicators—sales, profits, savings, salaries, employees and fixed assets (Blumberg 1985, 1989c).

Guatemala: In the SIMME microenterprise project, 1,623 individual loans averaging $1,300 had been granted by August 1988; 17.68 percent of these were given to women (N = 287). By that date, 15.3 percent of loans were in arrears (N = 248). Yet, only 26 women were in arrears. This means that women, who were 17.68 percent of the loan population, constituted only 10.48 percent of those in arrears (26 out of 248). The difference is significant (Blumberg and Reibel 1988).

In sum, in each of these cases, women proved to be better entrepreneurs and/or loan performers than men.

In general, microenterprise credit projects with many women clients were the most successful. Here are several examples:

Bangladesh: The renowned Grameen Development Bank has a minimal default rate, under 3 percent (Timberg 1988, 11) and, as of 1989, had provided loans to over 500,000 borrowers. These people are among the poorest of the poor, primarily landless and near-landless. Women receive smaller loans, on average. As of December 31, 1986, the Bank had 295 branches with 234,000 members. Of these, 69 percent were women, accounting for 55 percent of the cumulative loan amount (ibid., 10). Based on evaluations of relative male/female loan performance, those proportions rose rapidly, as the Bank's recent expansion has almost entirely been among women (ibid., 12). Indeed, the most recent figures (Helmore 1989) indicate that about 82 percent of borrowers are women—and that the bank is now growing at a rate of 10,000 to 15,000 new borrowers a month. Already it has reached 9,500 villages, 14 percent of Bangladesh's 68,000 rural communities (ibid.).

Indonesia: The enormous BKK program made 2.7 million loans between 1972 and 1982, amounting to over $55 million. Loans averaged $20, targeted to "rural families for off-farm productive purposes." Interest rates were high enough (5.6-10.8 percent per month) for the program as a whole to make a profit of $333,000 in 1981, a 7 percent return on its portfolio. Yet delinquency was only 6 percent on current loans. Fully 60 percent of the loan clients were women, overwhelmingly traders (Timberg 1988, 14).

Meta-evaluation of 100 LEIG (livelihood, employment and income generation) projects: Tendler's 1987 study found that microenterprise credit projects were among the most successful. She identified 8 of the 100 grantees as "better performers." As McKee (1988) stresses, 5 of the 8 dealt 100 percent with women and the other three gave serious attention to women clients from the start. All 8 were narrowly focused on economic rather than social welfare activities.

These cases suggest that: first, experienced female micro-entrepreneurs, given what is usually their first opportunity to get credit at non-exploitative rates, are at least as good credit risks as men.

Second, as explicated below, the microenterprise credit projects that succeed in reaching women are those that have eliminated the obstacles and constraints that often not only preclude women from getting such loans but also reduce the project's chances for success.

Many of the successful mixed-sex microenterprise credit projects did not initially seek out women as participants. But the better ones seem to have eliminated the "up front" constraints that typically prevented *poor* people from receiving credit. When these constraints were eliminated in a credit program aimed at poor microentrepreneurs, women were able to take advantage of the programs.

Specifically, as in the ADEMI microenterprise project in the Dominican Republic, successful microenterprise credit efforts managed to incorporate women and poor clients in general because of the procedures they adopted. ADEMI, for example:

- Reduced the number of trips that a person had to make to a credit office in order to process a loan application (generally, to a single visit);
- Did not require collateral for most loans (resorting to a group guarantee scheme, the "Solidarity Group," for the poorest clients);
- Used "streetwise" promoters (college night students who spent much of their time out in the field and who soon developed deep knowledge about and empathy for the microenterprise sector) to select loan clients and aid them with the application process (rather than bank bureaucrats, who tend to intimidate poor, uneducated, potential clients and who often have a deep-seated negative view of their loan repayment proclivities);
- Offered fast turnaround time, so that loans would be approved and issued in days rather than weeks or months; and
- Rewarded on-time payment by offering an immediate, new, slightly larger loan for prompt and full repayment (Blumberg 1985, 1989c).

These procedures overcome the high "up-front" costs that often place loans, even those at below market interest rates, beyond the reach of the poorer, less mobile (and frequently female) microentrepreneurs. In fact, most of the successful micro-enterprise credit projects are not low interest projects. They charge market rates of interest. But even these can be a great boon to, say, a market trader who previously had to rely on the moneylender's enormously higher rates for short term credit. As one woman cloth seller said about ADEMI: "It has freed me from slavery to the moneylender!"

The most successful ME credit projects have almost all been "minimalist" ones that give virtually nothing except credit (see e.g., Timberg 1988; Tendler 1987). Microenterprise (ME) credit projects are often more successful than other lending projects that give subsidized loans (below market rates) to much more affluent clients—an outcome that refutes many stereotypes about

development credit assistance. Development planners should also take seriously the fact that the most successful ME projects often have large proportions of female clients.[20]

As a summary hypothesis, one could propose that women entrepreneurs have so little access to credit of any kind that they make the most of their ME credit project opportunity. This could explain their better loan performance record, compared with males', and once again indicates that **tapping into women's productive potential enhances development.** When given a chance in an area where they already are economically active, women, spurred by their stronger unmet need for income—especially where they have provisioning responsibilities toward their children—tend to do their utmost "not to blow it."

It appears that women's better performance in ME credit projects stems from the same circumstances and motivations that made them more responsive than their male counterparts to the opportunity presented by the new road in Bilik Bindik, Cameroon, discussed in section 2.5. Just as credit access reduces economic constraints, the road drastically reduced women's marketing constraints for perishable food crops. This brings us to the topic of rural women's constraints to production and what happens when they are lifted.

3.3 Women's Production Constraints in Low Resource Farming

Three major kinds of constraints act as impediments to the productivity of poor women farmers in developing countries:

- Time constraints caused by their labor in necessary but "drudgework" tasks such as fetching water, collecting and utilizing firewood, providing fodder, and processing crops for cooking, market sale, etc.
- Inadequate access to the factors that facilitate agricultural intensification—extension, training, credit, and inputs.
- Less access to land and other factors of production.

The first two sets of constraints (especially the second) involve areas much more frequently targeted for development assistance than the third. Thus, the present discussion focuses on them. The third constraint involves redistributional issues frequently thought of as a "zero sum game." Such issues, rarely addressed by development donors, are beyond the scope of this monograph. For the first two sets of constraints there is an overview of the severity of each problem and a consideration of the effects of easing these constraints on women's productivity. The evidence suggests that lowering women's barriers in these areas adds to economic growth. When

[20] This, as we shall see, is a very different experience than that of women's access to *agricultural* assistance, extension, and credit. Thus far, very little has been done to reduce the constraints that prevent women farmers from participating. In fact, agricultural assistance to poor, small farmers, regardless of sex, has proven much more problematic than assistance to poor microentrepreneurs.

development interventions save much of women's time previously spent in fetching water and firewood and food processing, this is often translated into enhancement of income generation and/or output. It is not yet possible to point to a comparable body of evidence on effects of agricultural aid and extension on women's productivity—targeting women for extension is still too rare or new.

3.3.1 WOMEN'S TIME CONSTRAINTS FROM "DRUDGEWORK"

Time constraints resulting from women's labor in providing water, fuel, transport, and processing crops affect both women who work as unpaid labor in their household or their husband's holdings, and those who farm partially or fully on their own account. Time budget studies "reveal the fact that women universally work longer hours than do men" (Carr and Sandhu 1988, 4). When an expanded definition of productive activities is used, women are often found to provide more of the household's total labor input than men. Carr and Sandhu illustrate this with data from Nepal (Bennett and Acharya 1983) and Ivory Coast (FAO 1983) shown in Table 4.

Time budget studies also indicate that in many developing countries, two of the most time consuming jobs involve:

- Fetching water for household humans and animals; and
- Foraging for and transporting fuel/wood for cooking. In areas of deforestation, desertification, and/or increasing population pressure, these tasks have become more onerous and time-consuming in recent years. Drought lengthens the time needed to provide even minimal amounts of water, and deforestation makes it more difficult to provide fuel for cooking. The trek to find firewood becomes longer or crop residues and/or dung may be used—to the detriment of the soils and the crops. As women resort to more marginal kinds of fuel materials, the cooking fire may require increased tending even though it is less efficient.

In general, women bear primary responsibility for both water and fuel/wood provision except in areas where women are secluded or lose face from being seen in public doing such activities, and/or where the demand/scarcity situation has resulted in commercialization by males. Where women are obligated to perform these chores, they often pass along much of this burden to children (or servants, if any).

Indeed, in many countries, one or more household children may spend the entire work day fetching water, fuel, or both. This foraging and transporting responsibility has been cited as one important reason women, in many of the countries most bedeviled by water and fuel/wood provision, need more children than family planners would like them to have. With more of their children in school and/or away in seasonal or permanent migration, and often, with water and fuel/wood harder to get, women may need an extra child or so to help out with these chores.

Table 4: Men's/Women's Contributions To Economic Activities

Activities	Average Hours/Day (hours/minutes) Male	Female	Weighted Work Share (per sex)[1] Male	Female
A. Nepal				
1. Conventional "economic activities" (labor force participation)	5h/49m	4h/37m	51%	49%
2. Subsistence economic activities	54m	2h/10m	26%	74%
1+2 *Enlarged* economic activities	6h/43m	6h/47m	44%	56%
3. Domestic	47m	4h/02m	14%	86%
1+2 +3 "Productive work burden"	7h/30m	10h/49m	36%	64%
B. Ivory Coast				
1. Conventional	2h/31m	1h/25m	61%	39%
2. Subsistence	49m	1h/45m	29%	71%
1+2 "Enlarged"	3h/20m	3h/10m	48%	52%
3. Domestic	35m	3h/38m	13%	87%
1-3 "Productive"	3h/56m	6h/48m	34%	66%

Source: Carr and Sandhu 1988, tables on pp. 12-13.

[1] Weighted work share is *not* calculated from average hours/day; no explanation is given of the weighting, however.

Two other tasks related to production that take an inordinate amount of women's time under low resource conditions are:

- Other transporting tasks—carrying crops from fields to household or farmgate (sometimes, even a cheap wheelbarrow may greatly ease women's time burden in this regard); and
- Processing tasks—from hulling, winnowing, threshing, and pounding to frying (e.g., cassava flour, or *gari*) and smoking (e.g., fish). Doing these tasks the traditional way takes great time and energy

3.3.2 WOMEN'S LIMITED ACCESS TO AGRICULTURAL EXTENSION, TRAINING, CREDIT, AND INPUTS

One of the most frequent findings in the women in development literature is how little access women have to factors that facilitate agricultural modernization and intensification such as: training/extension, credit, and inputs.

Extension: Only now are a few, mainly African countries, largely in "female farming" zones, beginning programs to insure that women farmers are served by extension. In some areas, it is culturally inappropriate for a woman to have contact with a male extension agent in a one-on-one situation. As shown in Table 6 below, Swanson and Rassi (1981) found that over 97 percent of extension agents in Africa were males; moreover, it could be inferred that most of the 2.6 percent female agents at that time actually were home economists whose inputs on farming were extremely limited. Even where there are no strong cultural prohibitions on cross-sex extension contact, women still are rarely included in extension, even in token numbers (Wycoff-Baird 1988).

Training: The location and timing of training programs typically preclude women from participating in them. If the training requires overnight stays or longer and if there are no culturally appropriate dormitory facilities for females, and/or provision for them to bring their youngest child, women's attendance is impossible even if they are selected (and, in general they are not). Sometimes women are even unable to attend courses designed to help them in female tasks. For example, an A.I.D. Thai sericulture project gave a one-month course on new methods of silkworm care. Even though this is a distinctly female task, only about half the participants were women. Many women could not get away to attend, especially at that point in the cropping season (Blumberg 1982/1983).

Credit: Lacking adequate collateral, especially titles to land, women have had very limited access to credit, even in agricultural credit projects aimed at small farmers. Women often are outside the communication networks (e.g., via male extension agents) that spread the word about new credit projects. Staudt (1979, 1985), for example, found that the women farmers in her Kenyan sample were 14 times less likely to receive credit information than their male counterparts. The likelihood of women being recipients of agricultural credit is even lower if the credit is

subsidized (i.e., at below market rates of interest) and the project is "gender neutral." These almost invariably become "one gender absent" projects.

Inputs: As with credit, where inputs are subsidized, women's likelihood of receiving fertilizer, planting sets, improved seeds, etc. appears to be even lower than for unsubsidized inputs. With or without subsidies, if these inputs are not free, women are less likely to be able to afford them. This is particularly the case if the women intend to use the inputs mainly for a crop used more for subsistence than for market sale.

The production potential lost from lack of access to these inputs is greatest where the women are farming at least partially on their own account and are important producers, as is the case in sub-Saharan Africa. Studies also have documented the bypassing of women cultivators in the Caribbean (e.g., Knudson and Yates 1981), Southeast Asia (e.g., Blumberg 1982/1983), and worldwide (Berger, DeLancey and Mellencamp 1984; Ashby 1981).

3.4 Easing the Constraints on Women's Productivity

3.4.1 WOMEN TURN EASED CONSTRAINTS INTO INCOME GENERATION

When the time constraints of water and fuel collection, transportation, and crop processing are reduced, many women pursue income generating activities. Carr and Sandhu (1988) present "evidence, for those who require it, of reallocation of time to productive income-generating activities" (ibid., 44). They also cite a few studies indicating that, when one of the above constraints was eased, women used the time saved for rest, social activities, or domestic tasks not normally measured as productive. Combining their examples with my own, here are instances of income generation outcomes from the easing of each time constraint:

Water: It is often found that when women gain access to more water, closer to home, they increase their use of water, thus cancelling much of the time saved. While some of this water is used for domestic purposes such as cooking and better hygiene, women also have found ways to turn that water into cash.

> **Northeast Thailand:** A 1979 evaluation of a potable water project, begun in 1966, involved a stratified random sample of 52 of 600 village installations. All but 7 were functioning—a much higher percentage than had been found in evaluations in the early 1970s. The evaluators discovered that the water was not being used for drinking because the villagers disliked its taste. Gradually the villagers found *economic* uses for the water unanticipated in project design. These included irrigation of horticultural crops, small animal raising, and craft production activities carried on or in the immediate vicinity of the household. Although the evaluation does not specify which gender was using the water for economic purposes, these are activities in which women tend to have an important role in control of resources as well as provision of labor. The evaluation does specify that women and children gained time and the women used that time: "for activities such as weaving and gardening to either generate income or raise the household subsistence level. These activities were said to be less menial than waterbearing. 'Women prefer raising vegetables

and weaving,' it was said, 'because it is not so boring and it lets them use their brains'" (Dworkin and Pillsbury 1980, p. ii; discussed in Blumberg 1982/1983, 56-57).

Kenya: Tinker (1981; see also Carr and Sandhu 1988, 44) discusses one case where women with an improved water supply were selling some of it to finance own-account livestock and vegetable crops.

In fact, a general pattern emerged in a desk review of a random sample of A.I.D. sanitation/water supply projects. Nieves (1985) "found that reduction of time spent carrying water did not increase time spent on production unless income-earning opportunities already existed or were introduced" (Carloni 1987, 31). Finally, it must be pointed out that there are places where women's water bearing burden is so great that it limits production, whether for women's benefit or not. For example, Carloni notes that one reason women in Kitui District, Kenya cannot plow and plant on time (when the rains come) is that *half* their productive time is spent fetching water from distant sources.

Fuel: Based on a number of studies, Carr and Sandhu conclude that the total time spent on fuel provision and cooking is fairly fixed, so that if women spend more time fetching firewood, less time is left for cooking, and vice versa. But they also cite one study of an income-generating use engendered by better firewood provision.

Philippines: An ILO study (Cecelski 1984) "found that women were willing to pay more money for easily used woods so as to reduce the amount of time which needed to be devoted to tending the fire during meal preparation. This allowed mats to be made at the same time meals were being cooked. Women sold these—thus earning cash to compensate for the extra expenditure on fuel" (Carr and Sandhu 1988, 46). It may be inferred that the women's mat making returned more than just the extra cost of the fuel, although this is not explicitly stated.

Transport: In much of the developing world, women, unaided by even a cart or wheelbarrow, transport most of the water and fuelwood and a good deal of the harvest. Women, especially in Africa, often carry crops on their heads from field to home to market. Carr and Sandhu cite two studies where the provision of animal transport enabled women to use this saved time for income-generating activities.

North India: Following the introduction of mules, which freed time women had spent carrying fuel, they began income-generating activities such as knitting and tomato growing (Cecelski 1984, in Carr and Sandhu 1988, 46).

Burkina Faso: This example is particularly relevant for the present monograph because both men and women benefitted. Donkey carts were introduced and men, who traditionally would not carry wood, water, or harvested crops, used them to transport water and wood for sale. Women used the freed time to engage in cotton spinning, which is often an income-generating activity, and for rest (ibid., 46-47).

Processing technology: Sometimes, when machines or mills for grinding, hulling, etc., are introduced, the poorest women in the community lose an important income source. This occurred in the well-documented case of the introduction of the electric rice huller in Java, Indonesia (see Stoler 1977; Milone 1978). At other times, such technology has been introduced to and controlled by women, for their economic benefit.

> **West Sumatra, Indonesia:** In West Sumatra, the women's clans still own the land, and the effect of the introduction of the HYVs [high yield varieties, in this case, "Green Revolution" rice] was entirely different than in Java. In fact, women buy the costly inputs, own the rice hullers, and employ men with knives and scythes to help in the harvest. Before these developments, Minangkebau women kept control of earlier technological innovations, such as mechanized spice grinders and the water driven mills which they still own and use to grind flour. In Aceh, as well, where women can own the rice fields, they have kept authority over earlier labor-saving devices, such as mortar and pestle for rice pounding, and now use hullers to reduce losses and produce a better quality of rice (Milone 1978, 156-157).

> **Ghana:** Carr and Sandhu (1988, 49) discuss an ILO/Netherlands Government (1985) report concerning the introduction of improved ovens for smoking fish. Processing fish, particularly through drying and smoking, is an important activity for women in Ghana and elsewhere in Africa. They don't mention it, but fish smoking is also an income-generating activity for most of these women. Women with the improved ovens in their compounds were able to smoke three cycles of fish per day, compared with only one previously. Since the new ovens were easier to operate, women could combine fish smoking with other household chores. These women chose to process more fish in the same time rather than the same amount as before in much less time. Once again, we can infer that, despite heavy work burdens, women opt for income over leisure when the income is needed and under their own control. Apparently these women gained extra time for themselves over and above the three smoking cycles per day. "With the improved smoker, women complete smoking early enough to get time to relax. Cooking of regular meals for the family has now become a common feature of 56 percent of the women who before then had no time to cook and therefore bought cooked food from outside" (ibid.). Carr and Sandhu do not mention whether this adversely affected the incomes of the women who sell cooked street foods. But they do note that the women fish smokers used the remaining time saved for: farming, household chores, visiting, and rest.

All of these examples show instances where individual women benefitted because a time constraint was eased and they were able to turn the time and/or the activity into income under their own control. The next example suggests how an entire country can benefit when the water and fuel/cooking time constraints of farm women are eased.

3.4.2 COMPUTER SIMULATION OF DEVELOPMENT SOLUTIONS FOR YEMEN

In 1985, Howe analyzed the economic problems and prospects of the Yemen Arab Republic (YAR) with and without taking women into account. The differences are remarkable. According to Howe's statistical portrait, the YAR economy receives the bulk of its foreign exchange from remittances from adult males working outside of the country. At any given moment, one-half of the working age males have migrated—mainly to neighboring oil-rich Gulf states (where their jobs depend on the world price of oil). Yemen's exports are negligible. Small-scale, low resource

farming occupies most of the population. Official statistics indicate that 45 percent of the women are engaged in agriculture full-time as unpaid family labor. According to Howe, income from agriculture is controlled by males. In fact, rural Yemeni women have neither provider responsibilities nor any real income-generating opportunities (Carloni 1988).[21]

One of the biggest problems facing the YAR is the decline of its agriculture. A six-province census listed 16.6 percent of the land as permanently abandoned by 1980. The rate of abandonment is increasing at 2.2 percent per year. Food imports have surged from 0.83 billion *rials* to 2.03 billion between 1975 and 1982. With a total 1982 GNP of 17.0 billion, and remittances totalling 6.94 billion in 1982, this means that almost 30 percent of remittance income and 12 percent of total GNP are spent on food imports (see Figure 2). The problem is one of food production shortfalls, not shifts in consumer preferences. If present trends continue, food imports will jump to 4.4 billion *rials* (at constant prices) by the year 2000. A food deficit of this size gravely threatens the viability of the Yemeni development effort.

But present trends need not persist. Howe demonstrates that the food deficit could be almost entirely eliminated by the year 2000. How? The male farm labor force is highly unlikely to expand. In fact, the government relies on remittances, sent by male migrants, to fund its development plans. However, women's agricultural labor could be greatly increased by reducing time spent fetching water and wood, providing firewood, and cooking.

From available data, Howe took rather conservative figures for the time that the females of a given household spend in these routine domestic activities. Then he calculated what would be saved from providing improved water supplies (but not piped-in water) and butagas or kerosene for cooking. He found that time spent by women in those routine domestic activities would drop spectacularly from 11.5 to 1.7 hours per household per day.

The estimated 11.5 hours/day for these three tasks includes the efforts of all the adult and adolescent females of the household. The average Yemeni household has eight members. Howe arbitrarily estimated the typical composition as: a senior generation adult male and female, a junior generation adult female, an adolescent (10-14) male and female, and young male and female children (under 10). The junior generation adult male is assumed to be out-of-country as a temporary migrant.

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[21] This example illustrates that peering within the "black box of the household" reveals a diverse *continuum* vis-a-vis a gender-disaggregated "internal economy." At one end of this continuum are the partially "separate purses" households prevalent in much of Africa. At the other end are the more unitary households found, for example, in some Islamic areas, such as rural Yemen (YAR). The problem has been that households at both ends of this continuum (as well as those in between) have been conceptualized and treated alike by the prevailing single production function model of the household. Just where the households of a particular group falls on this continuum should be the subject of empirical determination, not a priori assumption.

Howe suggests that if even half the increased time enjoyed by the two adult females were devoted to agriculture, it would increase the household agricultural labor supply by almost 30

Table 5: Approximate Daily Labor Time Required For Major Domestic Tasks Per Average Rural Household—Current And Improved Conditions

YEMEN ARAB REPUBLIC

Task	Current Time (hours)	Improved Time (hours)
Cooking	3.0	0.5
Fuel collection	3.0	0.0
Water collection	5.5	1.2
Total	11.5	1.7

Source: Howe 1985, 94, Table 13.

percent and still leave the adolescent girl with half her time free to attend school—something she currently doesn't have time to do. In the YAR, only 3 percent of the females over age 10 can read and only 11 percent are enrolled in primary school. Men are 16 times more likely to be literate.

Howe shows that, under the current system, rural Yemeni women are fully occupied. According to official statistics, 45 percent are engaged in full-time cultivation, which is close to the calculated maximum (50 percent) that can be achieved given the amount of time women must spend on the necessary tasks of collecting water and fuelwood as well as cooking. He asserts that it is not remittance-based "affluence" that restricts the supply of female agricultural labor; it is the ceiling imposed "by the present organization of domestic reproduction" (Howe 1985, 92).

In sum, providing improved water supplies and cooking fuel to women—and then improving their agricultural productivity via extension—should be considered investments that can mitigate the growing crisis in national accounts represented by burgeoning food imports.[22]

Howe also tackles the problem of Yemen's labor shortage, especially in education and health. Currently, 50 percent of the M.D.s, 66 percent of the nurses, and 87 percent of the teachers are expatriates (mainly Egyptians). Their numbers are rising, as are the remittances they send out of the YAR—to the detriment of the country's balance of payments. Even modest increases in female education, enabling Yemeni women to go into teaching and nursing, could dramatically decrease the need for expatriates and hence reduce the rising outflow of foreign exchange. The foreign exchange savings provided, just from reducing needed expatriate teachers from 36,000 to 24,000 by the year 2000, would amount to about 1.2 billion *rials* from the cutback in remittances these expatriates presently send home. Currently, Saudi Arabia pays their salaries as part of its aid program to the YAR. If this assistance were ended, the ensuing crisis in national accounts would enormously magnify the problem.

Furnishing the water and cooking fuel that would free *time* for girls to attend school could be the first step. Providing enough schools and teachers for increasing female enrollment would come next. Howe calculates that the short run cost increase this would entail would be greatly overbalanced by the longer term foreign exchange savings as the YAR would need fewer expatriates to teach its children and minister to its people's health.

While this is a computer simulation model, the effects are extrapolated from existing data. Howe's assumptions may strike some as somewhat optimistic about the magnitude of the impact of reducing women's drudgework constraints. But even a conservative assessment of the data leads to the conclusion that reducing women farmers' time/labor constraints should have a major impact on their time available for production and/or education. Thus, easing these constraints should substantially enhance national accounts and YAR economic development prospects.

3.4.3 STEPS TOWARD REACHING WOMEN FARMERS WITH EXTENSION

There are various means of facilitating agricultural intensification in addition to machinery. These include: extension, training, credit, and inputs (fertilizer, seeds, chemicals). The present discussion focuses on extension, particularly the gender of extension agents and extension clients. Africa is emphasized, since this is where both the food shortfall and the predominance of female food producers are greatest.

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[22] Opening the country's male-based extension system to deal with women cultivators will require planning, and governmental commitment in the highly traditional, Muslim YAR. Either women extension agents must be used (initially, expatriates, it must be assumed), or, perhaps, male extension agents could work with suitably convened and chaperoned *groups* of women. In short, while reducing women's drudgework burden via improved water supplies and cooking fuel will free some female labor, that labor must become more productive. Otherwise, Howe's optimistic predictions about the near-elimination of the food deficit by the year 2000 may be unattainable.

3.4.3.1 Women Extension Agents—The Key to Reaching Women Farmers?

According to the extant data, if attention to women farmers must await the training and recruitment of sufficient female extension agents, it will be a long time before women cultivators will be fully served.

A worldwide overview: The most comprehensive, albeit ambiguous, listing of extension personnel by sex is that of Swanson and Rassi (1981). They use separate categories for agriculture and home economics. Very few women are classified under agriculture—except in three Southeast Asian countries. The Philippines lists 35 percent women (3642, vs. 6767 men); Thailand shows 20 percent women (936, vs. 3672 men); and Malaysia 13 percent (383, vs. 2612 men). Presumably, the women agents facilitate contact with farm women.

But the actual proportion of females who are fully trained agricultural extension agents may be lower than shown in the table. This is because some countries apparently list women in the agriculture category who actually are home economists employed in an agricultural division, perhaps under a title other than "home economist." For example, in Table 6, Nigeria shows nearly

Table 6: Male & Female Extension Personnel In African Agricultural Programs

Country	Agriculture		Home Economics*	
	M	F	M	F
Botswana	186	13	-	2
Gabon	88	2	-	-
Gambia	170	6	-	-
Mauritius	56	-	-	-
Namibia	13	-	-	-
Nigeria	1106	104	-	-
Senegal	1088	3	-	1
Seychelles	11	3	-	-
South Africa	1107	-	2	
Togo	200	-	-	-
Tunisia	-	-	-	-
Zimbabwe	1323	13	-	-
Total	5337	141 (2.6%)	0	5

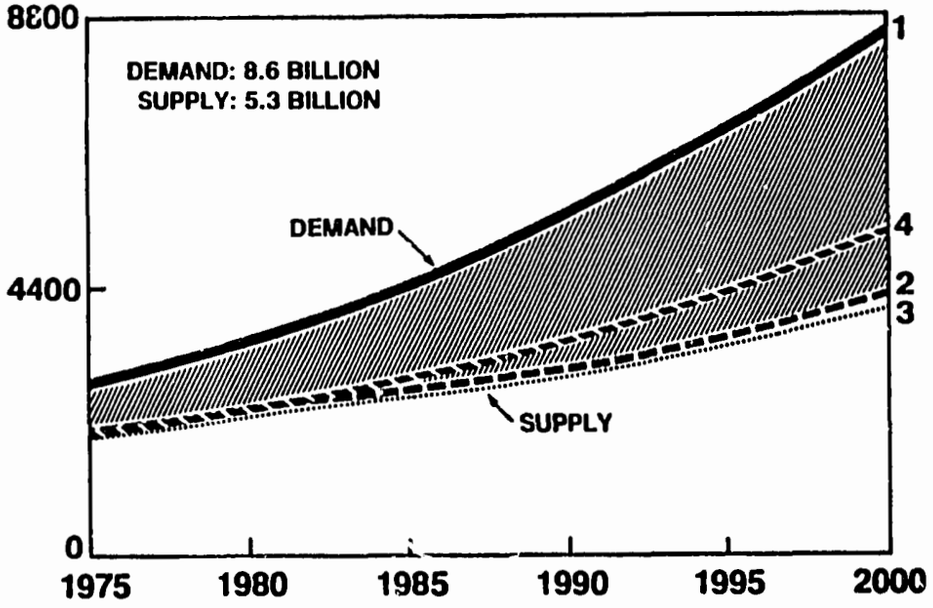
* Only home economists working under agricultural programs are shown.

Source: Swanson, B. E., & Rassi, J. (1981). *International Directory of National Extension Systems.* Urbana, IL: University of Illinois, Bureau of Educational Research.

FIGURE 2

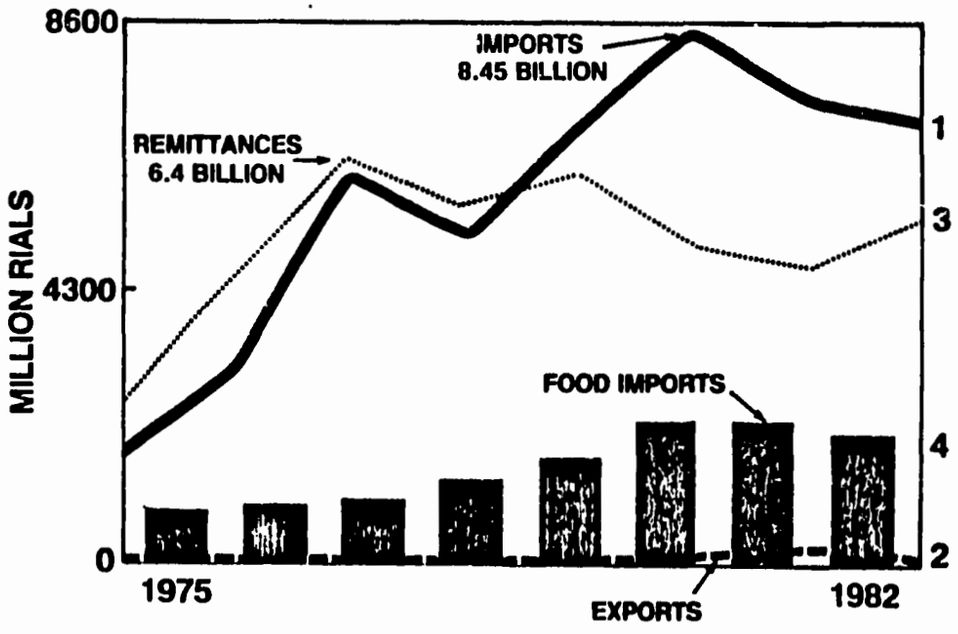
Economic Trends in the Yemen Arab Republic

FOOD DEMAND AND SUPPLY



Legend: Line 1 is demand; line 2 is supply at male rate of increase; line 3 is supply at aggregate male and female rate of increase; line 4 is supply including productivity rises.

IMPORTS AND EXPORTS



Source: Howe 1985, pp 69, 78

8 percent female agricultural extension personnel (104 out of 1210) and no home economists. As far as I could ascertain, the first handful of women extension agents, who actually worked in agriculture with farmers of both sexes, apparently was hired in 1985-1986 in Imo State in Eastern Nigeria. I found 7 women out of 291 agents in the summer of 1986 and 42/300 in December 1987, as further discussed below. In addition, I found a home economics unit within the agricultural extension service—as was true in various other states of Nigeria as well.

Swanson and Rassi's data from Africa (Table 6) are cited in all the overviews of gender and agricultural extension (e.g., Berger, DeLancey and Mellencamp 1984; Walker 1987). Hopefully, the dismal picture illustrated in this table is now becoming outdated. Indeed, in the last several years, Cameroon, even more than Nigeria, has aggressively recruited trained female agricultural extension agents who work on a par with and are paid the same as their male counterparts.

The Cameroon MIDENO Project: According to Walker (1987) and Koons (1988), the Mission de Developpment de la Province du Nord-Oest has made a strong recent effort to recruit agriculturally qualified women. As of 1987, it had achieved a higher percentage of women agricultural agents (18 percent) than anywhere else in Africa (Walker 1987, Table 2, p. 20). This was accomplished as part of a revamping of extension toward the World Bank-promoted Training and Visit (T&V) system (Benor and Baxter 1984).

Project funding from IFAD, the International Fund for Agricultural Development, was used to increase province village extension workers (VEWs) from 189 to 375, providing an almost unheard of VEW-to-farmer ratio of 1:400. A total of 50 women were hired along with 136 men. There were already 18 women VEWs but, until the project, they were restricted to home economics and kitchen gardens. All VEWs, both male and female, veterans and newly recruited, underwent an identical three month intensive training course. All VEWs were supplied with off-road motorcycles and demonstration equipment, such as chemical sprayers, maize shellers, etc. (Koons 1988, 7-8). This put women agents on an equal footing with male agents. The plan was for each of the VEWs to work initially with their own gender, and then gradually phase out the gender targeting in favor of a geographically based system in which agents would work with groups of both sexes within their zone. During the initial gender targeting phase, efforts were made to work with pre-existing groups of farmers. Almost everyone belongs to at least one, almost invariably single-sex, such group (ranging from cooperatives, church organizations, and rotating credit societies to various kin-based and neighborhood networks).

The typical African gender division of labor prevails among farmers in the province. According to one survey, women perform 72 percent of land preparation, 48 percent of planting, 70 percent of weeding, and 63 percent of harvesting (Walker 1987, 1). As usual, women raise and control the income from food crops and men concentrate on cash crops such as coffee. With increased access to urban markets, provincial women have turned potatoes, maize and, to a lesser extent, beans into

"near cash crops." "Women have responded to this opportunity for increased incomes by increasing production of these crops" (ibid., 7).

Despite some partial successes, reaching women was termed "the weakest aspect of the MIDENO project" Koons 1988, p. 11). Only 18 percent of the VEWs hired were women rather than the 33 percent in the project plans. So the initial gender targeting could not be fully implemented—there were too few VEWs to go around, especially since half the contact farmers were supposed to be women.

Second, since the female VEWs received the "same training and official agricultural positions as men, they took on, to some degree, the same elevated status" (ibid., 15). This meant that women farmers, mindful of cultural norms, were hesitant to ask questions of female, as well as male, VEWs. Still, the women VEWs were much better able to communicate with women farmers than their male counterparts, a result also encountered in the Caribbean by Knudson and Yates (1981).

All in all, VEWs often viewed women farmers as passive, traditional, and less willing to adopt new practices. Where the VEWs formed new groups, rather than working with pre-existing ones, the problem was compounded because the new groups were mixed in gender. Women were unlikely to violate cultural norms and speak up in this situation. Yet women were quite willing to get extension advice. Women's groups were larger than men's and often more women than men attended mixed groups.

One major difficulty lay in the VEWs' expectations that farmers would adopt the entire "package" of new practices. Women, who had lower income, tended to adopt only parts of a "package," or split a bag of fertilizer and seeds among themselves. The VEWs viewed this as unwillingness to innovate. Also, the VEWs expected farmers to step forward and request further information or individual farm visits, which often was not culturally appropriate behavior for women. As a result, surveys conducted by Koons showed that men received eight times more individual farm visits than women (27 men received 95 visits, whereas 25 women received 12 VEW visits).

Still, women farmers received some benefits. Although, in general, they "knew far fewer of the extension recommendations than did men" (Koons 1988, 12), [illegible] research found that they were twice as likely to follow recommended planting densities of improved maize. [illegible]y-two percent of the female contact farmers vs. twenty-four percent of the males used the proper planting density (Walker 1987, 23; Walker's data is newer, per Weidemann, 1989).

Unfortunately, the data on *results* of extension were not disaggregated by gender—of either client or VEW. Therefore, we have no way of knowing whether or to what extent the gender of the extension agents affected male vs. female clients' adoption rates and subsequent yields.

The shortfalls of this pioneer effort for substantial and rapid "gender integration" of agricultural extension personnel all seem quite correctable (the newer Walker evidence presented below indicates

that things have improved). And the project's achievement in recruiting and providing equal training and transport/equipment to women extension agents is considerable.

Innovations in Nigeria: Since the mid-1980s, Nigeria also has started transforming its extension system via the Training and Visit model. This model of extension has been criticized by many for its lack of attention to women farmers (e.g. Berger, DeLancey and Mellencamp 1984; Walker 1987; but see also Benor and Baxtor 1984). However, even critics feel that it *could* be implemented to reach women farmers.

Imo State, in the Ibo area of Eastern Nigeria, was the first to make a serious attempt to hire both women extension agents and reach women farmers. This is a densely populated, classically "female farming" zone. Until 1985/1986, agricultural extension had been staffed by males to deal with males. The following incident illustrates the strong male bias of that earlier system. In the spring of 1986, when I was a member of a research team working in another state in Eastern Nigeria (not Imo), we visited the farm of a "progressive farmer" who was involved in a variety of university-based research and outreach activities that we were studying (Gamble et al. 1988).

> **Imo State, Nigeria:** The team and I first interviewed the husband, who enthusiastically described the many types of help he received from the university and his state's agricultural development extension staff. The others went to see his yam mounds.[23] I stayed behind with an interpreter, a male agricultural economics graduate student, to interview the "progressive farmer's" two wives. Both were full-time farmers who traded bootleg gin in the off season. I queried the junior wife, a strong, strapping mother of six, about her access to technical assistance. The extension and university people all dealt with her husband, she explained, but sometimes she was able to talk with them. Most recently they had been explaining and promoting fertilizer and chemical application (e.g., pesticides, herbicides, and fungicides). Who handled this work? *She* was entirely responsible, hiring labor when she could afford it. Yes, her husband tried to explain what he had learned. Would she like to deal directly with extension agents and researchers? A short torrent of words showed clear assent. Then she paused, looked down, and added another soft phrase. The student translated that she would indeed like to get this information directly, then had added, "but it's OK the way it is..." He exclaimed: "Of *course* she would rather deal directly with the extension people; she's just being cautious not to offend!" We then accompanied her to the fields to rejoin the rest of the team.

By the time I arrived in summer 1986, Imo, unlike its neighbor, had already hired about 7 women extension agents (EAs) out of the total of 291 then employed by the statewide Agricultural Development Project (ADP). These women were trained in agriculture and worked with both males and females. Like their male counterparts, most of their clients were men, but they did deal with

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[23] His yam mounds were just then being planted by a mixed-sex labor force. Traditionally, Ibo women did not participate in the early phases of yam cultivation (mound-making, training the vines), since yams were "men's business"—the highest prestige, most valued crop. But with male outmigration has come a *further* "feminization of farming" in this already "female farming" zone. Despite tradition, we observed many mixed-sex teams making yam mounds. And, as soil fertility drops in response to shortening of the fallow, yams are increasingly displaced by cassava—traditionally a female grown/controlled crop.

more women (Blumberg 1986). This was only a drop in the bucket, however, given the predominance of women in cultivation in the state.

Between summer 1986 and December 1987, the number of women EAs rose to 42 out of 300—a not inconsequential 14%. Moreover, project management made another innovation of potentially broad applicability in sub-Saharan Africa. It began to reorient its home economics unit into a "Women in Agriculture" entity. The task was facilitated by two fortuitous circumstances: (1) all the home economists had trained at the local agricultural school, where they received one year of general agricultural courses—an atypically strong exposure to agriculture for a Nigerian home economics curriculum; and (2) all the home economists took advantage of their Ibo female farmer heritage by part-time own- account farming, to supplement their low salaries. Thus, while these women would need additional training in order to function as "Women in Agriculture" specialists, the base already had been laid.

Given that fully qualified female agricultural graduates are few and far between, while home economists are the most numerous category of women working in African rural/farming activities, the Imo innovation is potentially widely adoptable.[24] In most other places, the women would probably require more training before they could begin to transform their functions. It also should be noted that the Imo State "Women in Agriculture" unit was supposed to concentrate on helping with the crops in the ADP's "agronomic package" during the growing season, but focus on revamped home economics activities in the off-season. The new off-season emphasis is to be on crop-related activities such as processing, storage, and use, as well as on traditionally female-controlled crops (e.g., vegetables) that are not part of the ADP's "package."

It remains to be seen whether the Imo State "Women in Agriculture" retraining and reorientation of home economists will achieve its objectives. While a 1987 survey found most male EAs reacting positively to the idea of the home economists' refocused mission, the women themselves still had received little retraining and continued to suffer from insufficient transportation. The dignified, middle-aged and sometimes portly home economists were skeptical about scooters—the project management's idea of how to provide transport to the female EAs (funds permitting). Male EAs were supposed to get motorcycles.

A dissenting view on women extension agents: Carloni (1987) has synthesized the findings of the multi-phased A.I.D. research project measuring progress on women in development. Among the

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[24] A 1984 FAO study of "trained agricultural personnel" in Africa found that women comprised 3,510 of the 48,200 total for Nigeria, or 7.3%. (Nigeria, with about 105 million people, is by far the most populous state in Africa.) According to Natalie Hahn of the International Institute of Tropical Agriculture (1986), most of these women are home economists. Actually, there may be even more home economists in Nigeria. Another survey, involving 11 of Nigeria's then-19 states (now there are 21), reported 4,530 (Home Economics Association of Africa 1985). These figures further call into question the accuracy of the widely-cited Swanson and Rassi data presented in Table 6, which reported *no* home economists in Nigeria. How many home economists, in Nigeria or elsewhere in Africa, have even basic knowledge of agriculture is unknown.

ten field studies carried out for the project, five focused on women's access to extension (in Botswana, the Caribbean, Thailand, Kenya, and Nepal). In all five, some of the extension workers were female, but Carloni concluded that:

> Their contact with female farmers was not necessarily better than that of male extension workers. On the contrary, *both* male and female extension workers tended to focus on male farmers. One reason for the lack of contact with female farmers was the prevailing emphasis on commercial farming and cash crops. Extension workers had few incentives to spend time with subsistence farmers. In Botswana, extension workers of both sexes tended to focus on men because village women's family responsibilities made it more difficult for them to travel to extension centers. Direct contact by agents of either sex with village women was often restricted by inadequate transport (ibid., 30; also see Anderson and McBreen 1986).

When women extension agents are the only solution: In all of the examples, extension agents of both sexes had at least some contact with farmers of both sexes—i.e., cultural sensitivity did not preclude a male agent from dealing with women farmers (although in the Cameroon MIDENO project this was not supposed to occur until the women had been initiated into extension by a woman agent who had built trust and paved the way with possibly reluctant husbands). There are many areas, however, where it is not culturally appropriate for a male agent to deal one-on-one with a woman farmer. For example, in areas where seclusion is practiced to some degree, it would be shameful for all concerned. Here the only choice is to have women agents.

The danger, however, is that they will be cast in the home economics mold, rather than the "Women in Agriculture" role. All too often, even women home economists recognize that their clients would rather learn about income-generating activities within the farming system (e.g., raising small livestock and high value specialty crops in/around the household compound, processing staple crops and oil seeds for saleable end products) than about embroidery, making face cream, or other domestic science pursuits. But the home economists lack the training and/or transport needed to help women with these higher gain, but riskier, ventures. So they stick to low risk, low gain home economics activities that require less guidance.

Conclusions about women extension agents: Women extension agents may be a necessity where contact with unrelated males is culturally proscribed, and the evidence indicates that they can more empathetically communicate with women farmers. But merely hiring women agents is not enough. If the women agents: (1) remain in the home economics mold, (2) lack transport to get to women clients who might not be able to reach them, (3) are only rewarded for dealing with male-dominated cash crops, and/or (4) are not trained to overcome poor women farmers' reluctance to be forthcoming with high status people, their gender may be irrelevant and women farmers' productivity may not be enhanced.

3.4.3.2 Women Farmers as Extension Clients—How Much Progress?

Between Ashby's (1981) first major overview of women's access to extension and that of Berger, Delancey, and Mellencamp in 1984, progress was apparently slow and uneven. The latter study presents summaries of roughly a dozen projects, worldwide, where women farmers were ignored. Since the mid-1980s, however, a few governments, especially in Africa, have begun dealing with women farmers. Their aim is not to help women in particular, but rather to face the reality that women are the producers of crops crucially important to national development. Especially where scarce foreign exchange is being expended to import food crops, female food crop farmers would seem to be an increasingly appealing target.

One common element in several countries' recent approaches to women farmers is working with them in groups. There are several advantages: (1) lower costs, (2) less cultural sensitivity if the extension agent is a male, and (3) preference for working in groups on the part of the extension agents and the women themselves (Blumberg 1986, 1989d). In contrast, men farmers may be less willing to work in groups.

Here are some examples of increased contact with women as extension clients:

Kenya: Carloni and Horenstein (1986) found a dramatic increase in outreach to female farmers when extension workers began contacting local self-help groups instead of individual contact farmers. As other studies also will soon report, since the mid-1980s, there has been a push in Kenya to reach women's groups as collective "contact farmers" for extension.

Nigeria: At the same time that traditionalists among the management in the Imo State Agricultural Development Project claimed that male extension agents' (EAs) contact with women farmers would be culturally inappropriate and resisted by both the male agents and the women's husbands, a 1986 survey involving a 42% sample (N = 122) of the state's extension agents showed otherwise (Blumberg 1986). Unexpectedly, an astounding 90% of the male EAs and all of the females had *already* begun to work with at least one woman contact farmer. Only *3* EAs (all male) reported problems with husbands as the result of working with a woman contact farmer. In this area, extension contact was more likely to begin with individual women than with women's groups. Only about 12% of the EAs (all of them males) objected to working with women as contact farmers. All but a handful of EAs claimed that at least some of their male contact farmers' wives, daughters, and/or female neighbors came to listen to their instructions at least some of the time.

How well did these women do? Of EAs who worked with at least one woman contact farmer, 52% thought the female(s) did as well as the males. Moreover, 20% thought their female(s) did *better* than the males. Another 19% had mixed results with their women contact farmers. Only 9% reported that their female(s) did worse than their men.

Did women farmers want to be included? Here, the traditionalists among project management weren't sure, but the women interviewed were. Consensus was high among the 53 women queried, mostly in a series of five group meetings (about a dozen of the pioneer contact farmers were included in this purposive sample). All the women wanted to be included in the project's extension programs. "Only please," they asked, "let us listen to the extension agent in groups, not just individually." They explained that they were not literate and were afraid that they might miss part of the message in individual contact. In a group they could help each other

working in groups. This preference seems related to women's special constraints and special skills. On the "special constraints" side, lower literacy, and cultural norms of appropriate cross-sex contact may militate toward group contact. On the "special skills" side, prior organizational experience may also predispose women toward receiving extension in groups. More generally, women's "special constraints" include their lower levels of available time, resources (income, credit), good quality land, culturally appropriate assertiveness, and freedom of movement. Women's "special skills" include their greater knowledge of food crops, experience with single sex groups (especially in Africa), and ability to share knowledge and farming inputs with other women, so as to make a little stretch a long way.

3.5 African Market Women: A Case Study in Women's Economic Importance, Effectiveness, and Constraints

The market women of West Africa are legendary. There are even stereotypes of flamboyant entrepreneurs who have never been to school but are canny enough in their trading to merit a chauffeur-driven Mercedes. Some women do fit the image, and some have achieved an international scale of operation. For example, women traders/wholesalers were a very visible component of the passengers filling the jets to and from Lagos, Nigeria during the heady days of the oil boom and the $1.70 *naira*. But the overwhelming number of market women deal in small quantities, in markets overcrowded with competitors, and for low profits. Moreover, women are traders in many other countries in addition to those of West Africa. Some of the countries where women's trading is most visible include the Caribbean nations, Guatemala, the South American Andean nations and much of Southeast Asia, as well as various other African states.

3.5.1 WOMEN'S IMPORTANCE AND EFFECTIVENESS IN MARKETING

Concerning African market women, the data demonstrate two central points, according to Spring and Trager (1988, 3): (1) in much of the continent, women play major roles in the internal distribution of agricultural commodities, and (2) for many African women, trade and marketing are important components of their income.

In Ghana and Nigeria, in particular:

> Women comprise the central participants at all levels of distribution for most of the major commodities. These areas historically had high levels of urbanization with intermediate towns and cities that functioned as regional market centers ... In these systems, women traders are "middlemen" who are responsible for organizing the distribution of goods from one rural region to another and from rural to urban areas (ibid.).

3.5.1.1 Women Traders in Nigeria

Women traders of a number of Nigeria's 200-odd ethnic groups have been described (e.g., the Nupe long distance traders studied by Nadel (1942)). But the women in each of the three main

ethnic groups—Yoruba, Ibo, and Hausa—play such distinct and important roles in marketing that the commonalities and contrasts in their approach to trade are worth describing.

Yoruba women—600 years of pursuing comparative advantage: For at least 600 years, the Yoruba, in the southwestern part of Nigeria, have lived in their unique "urban farmer" pattern of large, occupationally diverse towns surrounded by 3-15 miles of fields. Men have been the primary farmers and women the traders. Women not only dominated town markets but, for centuries, have engaged in often far-flung itinerant inter-urban trade. Even during the 19th century civil wars, when travel and trade relied on armed caravans, many of the long-distance traders were women (Suderkasa 1973, 26). Today, Wipper (1984) estimates, 80% of all Yoruba traders are women.

Trager (1976-77) emphasizes that Yoruba women's trading is basic to the urban and regional distributive network. They function as: (1) rural traders, selling locally-produced commodities in rural periodic markets; (2) intermediaries who bulk and arrange for the transport of agricultural commodities along the rural-urban chain; (3) intermediaries who break bulk by resale to retailers in the urban markets; and (4) retailers in intermediate and large cities.

Yoruba women are known for their financial independence and for keeping "separate purses." The classic economic study, Galletti, et al. (1956, 77) found less than 5% who were fully supported by their husbands. Their strong commitment to entrepreneurial activities is reflected in the fact that a common greeting among Yoruba women is: "How are you selling?" In recent years, these dedicated entrepreneurs seem to be pursuing profit and comparative advantage in a new direction—own-account farming.

Although Yoruba women have been considered farmers only secondarily (mainly as helpers to their husbands), recent trends of rising prices for certain food crops and falling profits from many branches of trade have drawn many of them into agriculture. Spiro, for example, found that 34% of the women randomly sampled in three rural villages were own-account farmers—and 56% of those had begun farming only in the three years before her study. Rising food prices enabled women to earn more money by farming and trading than by trading alone (Spiro 1981, 21).

More recent studies (Gamble et al. 1988, and Cashman 1986) have corroborated this trend. Women stressed declining trading profits as the reason they wanted to begin or expand own-account farming. But not surprisingly, given 600 years of tradition, most want to combine farming with trade.

Ibo women—farmers first, traders second: Even though Ibo women of the southeastern part of Nigeria view themselves primarily as farmers, working for both their husbands and on their own account, they are active traders. Wipper (1985) estimates that 50% of Ibo trading is done by women. Typically, Ibo women sell surplus produce in the market during the agricultural season and then focus on trade—possibly in non-agricultural commodities—during the off season. In

common with Yoruba women, Ibo traders rely on rotating credit societies, members of their kinship/friendship networks, and, sometimes, husbands as sources of capital.

Hausa women—hidden trade from seclusion: One of the world's most unique trading patterns is that of Hausa women, almost all of whom sell agricultural commodities, prepared snack foods, handicrafts, etc. from the confines of seclusion in their compounds. Theirs is one of the most restrictive systems of female seclusion in the world. Premenopausal women are not supposed to leave their compound during daylight hours. Young, newly married women may go for months or longer without leaving.

In "Hidden Trade in Hausaland," Hill (1969) first described this pattern. She found that women engaged in two types of trade from their homes: (1) retailing of farmer-husband's grain and other produce, primarily on the husband's behalf; and (2) own-account trading (involving about 2/3 of the women studied). Other studies indicate that, although secluded women deal in everything from bulked grains to essential spices and household items such as kerosene, their most prevalent "hidden trade" activity is the processing and sale of cooked foods. For example, Simmons (1976, 8) found that of 465 women in three sample villages, 398 (86%) reported at least one food-processing activity as *sana'a* (an acceptable occupation for a Muslim married woman). Hawking of these cooked foods is carried out primarily via still unsecluded preadolescent daughters.

Hausa husbands are obligated by Islam to support their wives. Any income that women make, without breaking the rules of seclusion, is completely under their own control. Thus women are able to fund a virtually autonomous female economic sphere through clever use of the money their husbands give them for food. As a result of their seclusion, women gain the time to pursue their independent economic activities because they have no formal obligation to work in the fields or fetch water and firewood. Various studies have shown that women get a higher return from their trading activities than they could from fieldwork, which is not only lower status but much harder.

In this setting, husband-wife relations become highly monetized:

> Despite their virtual incarceration for the first 35 years of their married lives, women of the [village] enjoy a considerable degree of economic independence—thus having more in common with their sisters in the southern forest country than might be supposed. [Just as other kin interactions] often involve cash transactions identical to those between non-kin...a husband will pay his wife at (or near) the standard rate for 'threshing' groundnuts, her obligations being confined to domestic duties, mainly cooking...[And] a wife who makes groundnut oil for sale will pay her husband the proper 'market price' for any groundnuts she buys from him. Although, of course, husbands and wives are apt to help each other in numerous different ways, a wife's economic autonomy is often sufficient to insulate her from her husband's poverty—as shown by examples of prominent house-traders whose husbands are notably poverty-stricken (Hill 1969, 398).

3.5.1.2 Market Women in Ghana

Even more so than in Nigeria, "[w]omen in Ghana play the central role in nearly all marketing and distribution activities" (Spring and Trager 1988, 3-4). Women wholesalers are the most important sources of farm produce sold in urban markets, and women's marketing range extends from farmgate to final retail sale. Although there are more women in the lower reaches of the trade hierarchy than at its pinnacle, especially since the 1970s, Ghanaian women traders are found at all levels.

Robertson's (1984) study of market women in Accra, Ghana presents a number of life histories from women who are extremely knowledgeable about business in general and market trade in particular. Most of these women are lower class and uneducated. They move in an essentially all-female world—one that Adam Smith would have recognized:

> **Accra, Ghana:** A woman in her late 60s who smoked and traded fish until she turned to a less strenuous activity—making and trading corn wine—when she got old: "If I were giving advice to a young woman starting out in trade now I would tell them not to waste capital, concentrate on their work, and keep track of their profit position at all times. You have to watch the market constantly since it fluctuates all the time. We are all at its mercy. My own profits went up and down" (ibid., 74).
>
> A woman in her 80s: "My stepmother taught me a lot about business strategy...It was a lucrative business. I did not specialize in any one type of goods but tried out various commodities to see what sold best. You have to be constantly alert to seize opportunities and deal in as many goods as one possibly can. As a result one gets profits from many angles and will not feel worse off at any one time, especially in the case of farm produce which you can also use yourself. For example, once I was on my way to a women's church meeting when I happened upon an auction at the offices of the Accra Town Council. I bought L100 [pounds] worth of goods there which I then resold immediately in a batch for L107. L7 was a nice profit then" (ibid., 130).
>
> Other women operated on a considerably larger scale. One wholesaler of imported cloth, for example, by the 1950s, when she was in her 50s, was turning over between L4000 and L6000 a month. By then she no longer went to the villages herself, but had 10 other women selling the cloth for her. They got the profits, and she got the commission. In this way, she educated her five sons, even sending one to Britain (ibid., 102).
>
> Another woman in her 80s: "The main thing I liked about the bead trade was that it was profitable. Profit is what every person in business looks for, as long as the profits keep coming you stick to the enterprise" (ibid., 235).

Finally, the women's tradition creates backward linkages and employment, and tends to be transmitted from one generation to the next. Here is an example from a woman in the fish trade:

> "Since fish decomposes easily and there is much competition in the market, I find that the best strategy is to minimize your per unit profit to outsell your competitors and achieve a fast turnover. That way in the end you get more customers and more profits. Now I have a canoe and a fishing crew who fish for me. Sometimes they return from the sea empty-handed. As an employer I must provide them with money to tide them and their families over. This is, of

course, given against further catches. It is a worrisome responsibility sometimes...Now my daughter is carrying on with the fish trade" (ibid., 172).

3.5.1.3 Market Women Elsewhere in Africa

Spring and Trager (1988) note that, in various countries, men dominate certain levels of marketing and/or commodities, while women dominate others (e.g., fruits and vegetables in the Shona-speaking area of Zimbabwe, vegetables in Burkina Faso). As in Nigeria, within many countries regional variation is strong. In other areas where markets had not been well developed before colonialism, women have played a very small role in rural market trade but are now becoming increasingly important in market activities (e.g., in Tanzania, Zambia, and Uganda).

Spring and Trager generalize that women are important in urban retail market trade, especially in the informal sector - even in countries where their overall role in the market system is less central. They may sell farm produce in the market, process food for sale, or sell cooked foods, especially as street vendors. Particularly in the cities of southern and eastern Africa, they may brew/sell beer. As Jules-Rosette (1988) and others have noted, unlicensed beer brewing provides both the greatest profits and the greatest legal risks. In fact, she found that in Lusaka, Zambia, many women's occupations were classified as illegal and/or severely regulated and restricted. This greatly hindered women's efforts at making a livelihood, and also inhibited the operation of various sectors of trade (Jules-Rosette 1988). This brings us to the topic of constraints on women.

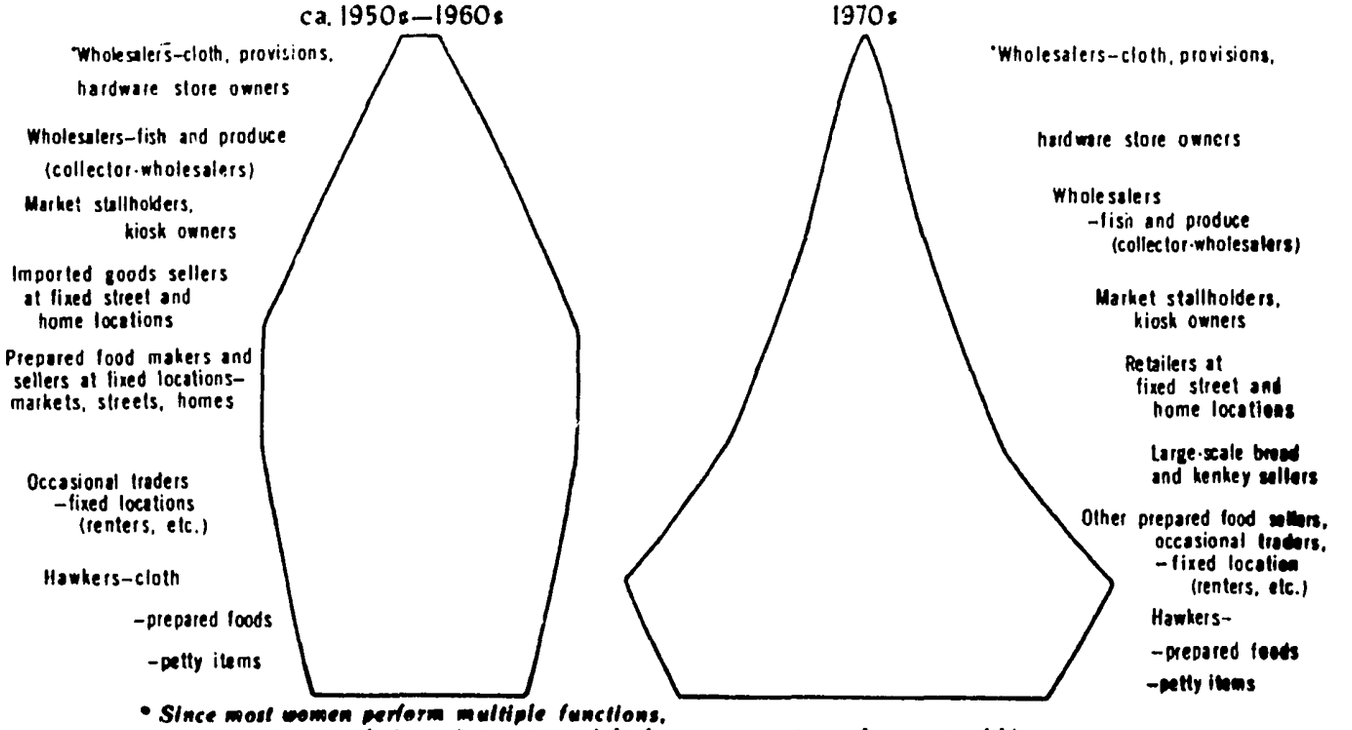
3.5.2 CONSTRAINTS ON WOMEN'S MARKETING AND TRADE: WHO PAYS?

Women in marketing and trade face numerous constraints already discussed in this paper, ranging from lack of access to formal credit to having to juggle the "double day" of productive and reproductive (domestic/childcare) activities. They often face additional constraints as well, since they frequently pursue the areas of trade that are most commonly the target of state regulatory policies. For example, in many countries, women often predominate among the street vendors of cooked foods. One study found that women constitute 94% of these sellers in the Yoruba city of Ile-Ife, Nigeria and 53% in Ziguinchor, Senegal (Cohen 1986, 5, cited in Spring and Trager 1988, 6). Street vendors, especially of cooked foods, are disproportionately likely to be the object of state regulatory policies, prohibitions, and day-to-day harassment. For example, most cities have laws banning street selling in central city locations, even though enforcement and/or harassment may be intermittent. Other rules about trading also may be on the books and subject to periodic crackdowns.

Evading harassment takes time and money that might otherwise have been invested in trade. Small scale women traders are more vulnerable to regulatory pressure, since they have less money for fines or bribes. Sometimes states target trading sectors dominated by women, or women traders

FIGURE 3

The Ga Trading Hierarchy (Ghana)



* *Since most women perform multiple functions, a cumulative point system might be necessary to rank women within groups.*

Robertson 1984, 121

as a group, accusing them of being price gougers who reap huge profits from food and imported goods.[26] But the (apparently) lone study on African consumer exploitation concludes that "charges of price gouging and other exploitative practices [by] Cameroon food crop vendors are largely unfounded" (Boyer and Davis 1988, cited in Spring and Trager 1988). The most extreme and dramatic examples of the persecution of market women have occurred in Ghana, where much of the private sector distribution system, as we have seen, remains largely in female hands. Robertson charges that:

> In fact, gender identity is increasingly being used by the governments of Ghana in an ideology which objectifies women traders into a class which can be blamed and persecuted for causing the enormous economic problems (ibid., 243).

During the 1970s, price controls (begun under Nkrumah) were ever more stringently applied, mainly to such imported canned "essential" foods as sardines, tomato paste, and condensed milk. During the Acheampong government years, "its newspapers headlined charges against petty traders of violating price controls and hoarding essential goods while people starved" (ibid., 244).[27]

Another government policy toward traders could be called "malevolent neglect" (ibid.). While market vendors paid substantial revenue to the Accra City Council, successive governments (from the late colonial era onwards) put very little back into the markets and allowed them to decay physically.[28]

Without a doubt, the most spectacular single act of harassment was the bulldozing of Makola No. 1 Market, "the center of trade in Ghana, and the chief wholesale and retail market [out of 19] in Accra" (ibid.). This occurred in 1979, under the first Rawlings government, and soldiers leveled Makala to a pile of rubble. As Robertson describes it:

> 'That will teach Ghanaian women to stop being wicked,' a soldier said (ibid.)...Sexist rhetoric was evident in the campaign against Makola. The *Ghanaian Times* described the bulldozing as a 'happy tragedy' producing 'tears of joy' for the 'worker, the common man [who] was helpless at the hands of the unfeeling Makola conspirators' (ibid., 245). [At the time of the bulldozing, Makola remained the country's most important hub of trade], despite many efforts by various [post-Independence] governments to remove control of the distributive system from the women traders (ibid., 244).

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[26] Ethnic "middlemen" minorities, such as Asians in certain African countries, may also be singled out in this regard.

[27] According to Robertson, "A typical gesture was the Acheampong government decree of 1976 ordering the street sellers to buy kiosks from the government; only the larger traders could afford one at an annual rate of C10 [*cedis*] to C150. Even some of them went under(ground) when the government ordered all kiosks abolished in a move worthy of Catch-22" (*ibid.*).

[28] "In Salaga Market the fishsellers have been evicted from the sole building due to its poor condition; it now echoes emptily the play of a few children and youthful hawkers inside to escape the broiling sun. There are virtually no adequate restroom facilities and the aisles are littered with chunks of broken cement and even ordure, on occasion" (*ibid.*).

Successive governments have been particularly repressive on traders of imported goods. The cloth market on the street next to Makola No. 1 had been largely abolished even before Makola was bulldozed. Under the second Rawlings government, mobs attacked the main markets in three other Ghanaian cities. According to Robertson, the combination of Draconian measures of oppression of traders (at times even including their summary execution for price control violations), and the overvalued currency, have "made the best places to buy Ghanaian manufactured cloth the markets in Abidjan [Ivory Coast] and Lome [Togo]" (ibid., 245).

> The upshot? "By [1984], even the produce markets have been severely damaged... Government repression has mainly hurt the small traders, because they cannot afford to pay bribes, and the distribution system as a whole, to the further detriment of the economy" (ibid.).

While the Ghanaian case is extreme, the burden of state regulation and repression has fallen heavily on the sorts of marketing activities most often done by women. Those activities, as we have seen, most frequently revolve around food. So once again, the undercutting of women's activities may well have worsened food availability in a number of African countries.

In summary, the neglect of women food crop farmers and the excessive constraints on the operations of private sector female food traders and marketers seem to combine in a case of "negative synergy." Together, these two acts of omission and commission may have an even stronger impact on food availability in sub-Saharan Africa than either alone. The contrast with the two examples at the beginning of this monograph is clear: countries that have adopted development strategies which draw on—and enhance—women's role in production (e.g., the United States, and the newly industrialized export-oriented Asian countries discussed in section 1.1) seem to have enjoyed higher national growth. Countries whose development strategies ignore or undercut women's economically productive roles seem to have suffered—most visibly so in Africa.

This concludes the discussion of the first "chain" of women's impact on the wealth and well-being of nations—that forged from women's productive activities, especially those that generate income under female control. Based on the above, the case for integrating women into economic development seems very strong. Now we turn to the second intertwined "chain," whereby women contribute to the wealth and well-being of nations via education. Here, "the case for the gender variable" seems unimpeachable.

CHAPTER FOUR

The Consequences Of Women's Education: A Cornucopia Of Human Capital

All the evidence about the consequences of women's productivity—especially where it produces income under women's control—makes a strong case for Sivard's statement that, "What is good for women is also good for the society at large" (1985, 7). The data concerning the results of educating women are even more dramatic. They reveal what a cornucopia of human capital and positive outcomes ensue from providing schooling to girls and women.

Worldwide, female education is generally associated with:

- Later age of marriage,
- Lower fertility,[29]
- Lower infant and child mortality,
- Improved health for their families and better nutrition for their children,
- Greater participation in the measured, waged, modern sector labor force,[30]
- Increased earnings, and
- Increased national development, as measured by Gross National Product.

The first six items almost always occur later in the life course than education, so it is plausible to conclude that female education plays a causal role. The evidence for lower fertility, lower infant and child mortality, and improved health and nutrition indicates that *mother's* education has a stronger effect than either fathers' or an education variable not disaggregated by gender.

The expansion of national growth and development is associated with both higher levels of female education and a lower disparity in the proportion of males vs. females in school. It is not yet possible to muster enough evidence to disentangle the direction of causation of what is clearly an interactive, synergistic process. Nevertheless, in section 1.1, we saw that the evidence for the United States (based on a series of aggregate production function studies) suggested that an appreciable part of the growth of the nation's economy since the turn of the century was

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[29] There are some countries where those with partial primary school education have slightly higher fertility than those with no education.

[30] This occurs over a threshold effect for education that differs within and between countries and over time.

attributable to increases in the stock of human capital—to which women's teaching made a significant contribution. In fact, not only is the principle of educating females less controversial than enhancing their production and own-account income, it is hard to find data that show any negative consequences from the education of females.[31]

Before examining the consequences of educating girls, let us first look at its prevalence and the extent of the enrollment gap between females and males. Next we will explore data for each of the outcomes of female education (from age of marriage through increasing earnings) listed above. Then we will examine simple regressions, based on a new and preliminary data set on the results of females' differential access to primary education. The regressions indicate that parity in male/female enrollments is associated with (among other effects) sharply reduced infant mortality, lower fertility, and higher GNP per capita. The discussion highlights the importance of females' education to their nation's wealth and well-being. At the policy level, the data presented indicate that investment to achieve male/female parity in education at primary and secondary levels may stimulate a cost-effective and powerful "multiplier effect" of positive economic and social benefits for the girl, her future husband and children, her community, and her country.

4.1 Comparison of Female and Male Access to Education

The inescapable fact about education in much of the Third World is that, despite a great post-World War II increase in girls' access to education, the gender gap in schooling is very wide. Two thirds of the women over the age of 25, compared with about half the men, have never attended school (Sivard 1985, 5). Even now, females in South Asia are only about half as likely as males to be literate or schooled, with their prospects only slightly better in the Middle East, Oceania, and Africa (see Table 8, below). A closer examination of the educational gender gap reveals statistics showing that in some aspects it is worsening, in other aspects it is little changed, and in still other aspects it is improving.

First, on the *negative*, side, the gap in numbers of girl vs. boy students is getting bigger as enrollment increases, despite the postwar increase in girls' enrollment. For example, Sivard (1985) found that:

- In 1950 there were 27 million more boys than girls enrolled in first and second levels of education. Currently boys outnumber girls by 80 million. In South Asia alone, where the male advantage is most pronounced, there would have to be 38 million more school places just to bring girls' enrollment up to boys' at the present time (ibid., 19).

[31] At worst, we find that in a few countries, largely in Africa, increased education is not consistently associated with lower fertility or higher formal labor force activity. All other positive effects seem to be found worldwide, albeit in varying degrees.

Moreover, the numbers/gap also is growing among girls:

- Combining first and second level education, the gap between girls' enrollment and school-age population widens. "In developing countries, almost 60% of girls 5-19 are not inschool. The ratio of enrollees to population is higher than it was in 1950 but, in absolute numbers, the difference between the population of girls and the number in school amounts to 350 million, 100 million more than in 1950" (ibid.).

Second, in other aspects, the gap has *changed little* since World War II, although more girls attend school than in the past. Here are three such aspects:

(1) Examining the *worldwide* figures on gender differences in enrollments (Table 7), we see that the proportion of girls has risen appreciably only for the third educational level (i.e., post-secondary schooling).

Table 7: Proportion of Girls vs. Boys, 1950-1985, 1st-3rd Educational Levels

	1950	1985
First Level	44%	45%
Second Level	42%	45%
Third Level	32%	43%

Source: Sivard (1985, 19).

(2) Girls continue to be more disadvantaged when countries cannot educate all the school-age cohort:

- According to the UN, school systems in at least one in three developing countries cannot yet accommodate all the children who should attend school. In Africa, four out of ten eligible children could not be enrolled in 1980 (Sivard 1985, 18). In almost all LDCs with such limitations in education facilities, girls are more likely to be left out than boys.

(3) The story is similar for literacy. The wide gap between males and females has not declined significantly in recent years.

- In developing countries, "a literacy average of 50% for women contrasts with 68% for men," even though there is no literacy gap between men and women in developed countries (ibid., 19).

Third, on the more *positive* side, UNESCO data and projections indicate that the enrollment of girls in the world's schools and universities is about 300 million higher in 1985 than in 1950 (ibid., 18). "Girls' enrollment quadrupled during this period, rising from 95 million in 1950 to a projected 390 million in 1985" (ibid.). At all age levels, an increasing proportion of girls is able to attend school. In absolute numbers, since 1960, nearly 500 million more women around the world have become literate, so the total is now over one billion.

Even Sivard, who compiled the educational gender gap statistics presented above, concludes that: "Education may well be the area where women have made the greatest gains in recent decades" (ibid.). Since the consequences of education for girls and women are so positive, it is good news that girls' Gross Enrollment Rates (GER) are growing worldwide and gender disparity in education is declining in a number of developing countries.[32]

Table 8 presents a more precise picture of the gender gap in education in developing countries. The extent of the gap varies greatly by region and country. It is narrowest in the Latin America/Caribbean Region and widest in South Asia.[33] Not surprisingly, the gap is narrowest in the countries of the developed world, both capitalist and socialist.[34]

4.2 Age of Marriage: A Prelude to the Education-Fertility Link

4.2.1 EVIDENCE FROM THE WORLD FERTILITY SURVEY

The World Fertility Survey (WFS, see United Nations 1987) will be the primary data source in explicating the positive consequences of educating women. The WFS sample involved 38 developing countries, fairly evenly divided among three regional classifications: (1) Latin America and the Caribbean, (2) Africa, and (3) Asia and Oceania. Although its primary purpose was to explain fertility patterns, it presents information on a number of variables associated with education. One of these is age of marriage, which proves to be strongly related to education. The "singulate mean age of marriage" (SMAM) for women with seven or more years of education is nearly four years higher than for women with no schooling. Women with no education marry, on average, at age 19.2; those with seven or more years of schooling marry at 23.0. This effect is found in all three regional classifications and at all four development levels (from low to high) into which the sample is divided. Education has the strongest effect on the age of marriage in the less developed

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[32] In section 4.8 there are some preliminary regression results for primary education for over 50 countries showing the relationship of an index of girls' primary school GER and the boy/girl education disparity ratio, on a number of development indicators.

[33] In fact, data not shown in Table 8 demonstrate that the gender gap in education in Latin America is narrower than in the least developed European countries—Albania, Greece, Malta, Portugal, Spain, and Yugoslavia.

[34] For example, in the United States since 1985 women have received over half of all bachelor's and master's degrees.

of the 38 countries (4.8 years), particularly in the African region (5.2 years). The most dramatic case is Benin, where women with no education marry at an average age of 16.9 in contrast to those with seven or more years of schooling who marry at age 24.1—a difference of 7.2 years.

4.2.2 SCHILDKROUT'S STUDY OF SCHOOLGIRLS IN A MUSLIM CITY

What do these national level data mean in human terms? As part of a larger project that also researched female seclusion and "hidden trade" in the Northern Nigerian city of Kano, Schildkrout (1982, 1984) conducted a study of 100 Muslim Hausa children. She studied them in 1976, and again in 1981, and found that education was very important for their life chances.

In 1976, the same year Schildkrout began the study, the Nigerian government began implementation of the Universal Primary Education (UPE) Law. In 1976, the only girls enrolled in school were those whose fathers had some Western education, and whose secluded mothers did not engage in occupations requiring the constant assistance of children.[35] Most people indicated that their daughters would not go to post-primary school. But the 1981 follow-up study found that—surprisingly—most of these girls were still in school. Furthermore:

> This first generation of school attenders had not only enrolled in secondary school but had passed the traditional age of marriage [12-14]...With boarding schools [built by the government] many families were able to accept the risk of delaying marriage. Moreover, the increase of Western education for men meant that many men were interested in women with some education (ibid.).

In families where women's trade is carried out with the assistance of preadolescent daughters, resistance to their schooling continues. The contrast in the lives of the schooled and unschooled girls is extreme:

> Five years after our original study of one hundred children, we found that every girl who had not been enrolled in primary school was married and in seclusion by age twelve (ibid., 47-48).

4.2.3 EFFECTS OF SCHOLARSHIPS ON BANGLADESHI GIRLS' MARRIAGE PATTERNS

Female seclusion, or *purdah*, is also practiced in Bangladesh, where female educational disadvantage is great and girls marry early. According to Martin (1987), in 1984 girls comprised 41% of primary school enrollment and only 32% at the secondary level, where most schools are private and fees are charged. Further:

> Data from the 1975 Bangladesh Fertility Survey...indicate that among ever married women... 20-49, those with no schooling married on average at age 12.8 years, those with some primary schooling at 13.6 years, and those with more than primary at 14.7 years. Unpublished census data from 1974 show that among females of ages 15 to 19, 81.0% of those with no schooling

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[35] As noted earlier, many secluded Hausa women's "hidden trade" was conducted via the help of their still-unsecluded preadolescent daughters, who delivered needed materials and hawked final products.

Table 8

Female Enrollment as a Percentage of Male, Developing Countries, 1980

	Adult Literacy Rate	Numbers 1st & 2nd Levels	Enrolled: 3rd Level	Average
Developing World	**72**	**76**	**52**	**67**
Latin America	**94**	**96**	**77**	**89**
Argentina	99	101	102	101
Barbados	98	97	76	91
Bolivia	73	86	47	69
Brazil	96	100	102	99
Chile	97	99	65	87
Columbia	98	100	66	88
Cuba	100	96	87	94
Dominican Rep.	97	100	85	94
Ecuador	93	98	57	82
El Salvador	90	96	51	79
Guatemala	73	82	40	65
Guyana	97	99	88	95
Haiti	73	85	38	65
Honduras	97	95	59	84
Jamaica	103	104	76	94
Mexico	93	92	50	79
Nicaragua	98	105	48	84
Panama	99	98	119	105
Paraguay	93	92	76	87
Peru	81	91	52	75
Trinidad/Tobago	96	99	65	86
Uruguay	100	100	109	103
Venezuela	93	102	85	94
Middle East	**57**	**69**	**41**	**56**
Bahrain	69	85	67	74
Cyprus	89	96	71	85
Iran	54	65	48	56
Iraq	47	74	45	55
Jordan	68	87	84	80
Kuwait	75	86	134	98
Lebanon	77	91	34	68
Saudi Arabia	35	63	36	45
Syria	49	70	43	54
Turkey	62	73	33	56
U. Arab. Emir.	63	88	81	77
Yemen, Arab Rep.	11	14	15	13
Yemen, Peoples Dem.	33	55	39	42

Table 8 (cont.)

	Adult Literacy Rate	Numbers 1st & 2nd Levels	Enrolled: 3rd Level	Average
South Asia	**52**	**56**	**34**	**47**
Afghanistan	23	20	22	22
Bangladesh	46	49	16	37
India	53	59	35	49
Nepal	16	33	22	24
Pakistan	46	34	36	39
Sri Lanka	87	96	54	79
Far East	**82**	**84**	**57**	**74**
Brunei	98	96	142	112
Burma	74	90	104	89
Cambodia	50	70	25	48
China	—	80	30	55
Indonesia	75	83	42	67
Korea, South	92	89	32	71
Laos	71	80	40	64
Malaysia	78	92	55	75
Mongolia	92	104	144	113
Philippines	98	104	113	105
Singapore	80	96	74	83
Thailand	90	90	77	86
Vietnam	—	91	37	64
Oceania	**72**	**76**	**25**	**58**
Fiji	88	99	33	73
Papua New Guinea	62	66	21	50
Africa	**61**	**75**	**36**	**58**
Algeria	40	70	33	48
Angola	53	62	—	58
Benin	42	52	21	38
Botswana	98	120	62	93
Burundi	38	63	25	42
Cameroon	58	81	21	53
Cent. Afric. Rep.	40	55	17	37
Chad	24	36	7	22
Congo	63	85	18	55
Equatorial Guinea	—	64	10	37
Egypt	50	71	47	56
Ethiopia	46	54	22	41
Gabon	71	91	30	64
Gambia	41	49	31	40
Ghana	63	74	16	51
Guinea	40	49	26	38
Ivory Coast	53	60	26	46

Table 8 (cont.)

	Adult Literacy Rate	Numbers 1st & 2nd Levels	Enrolled: 3rd Level	Average
Africa, cont.				
Kenya	58	88	23	56
Lesotho	140	140	162	149
Liberia	43	57	38	46
Libya	47	83	30	53
Madagascar	81	88	52	74
Malawi	52	69	31	51
Mali	42	54	14	37
Mauritania	—	53	14	34
Mauritius	84	93	33	70
Morocco	44	59	32	45
Mozambique	52	71	60	61
Niger	43	56	27	42
Nigeria	50	82	19	50
Rwanda	64	92	7	54
Senegal	45	64	30	46
Sierra Leone	52	63	20	45
Somalia	30	57	11	33
Sudan	37	66	37	47
Swaziland	91	100	57	83
Tanzania	90	88	21	66
Togo	44	56	21	40
Tunisia	56	68	49	58
Uganda	62	71	32	55
Upper Volta	28	59	33	40
Zaire	50	77	20	49
Zambia	73	85	17	58
Zimbabwe	80	83	56	73

Source: Adapted from Sivard (1985, 22-23).

Notes: Where a statistic is not available (—), the average is based on the remaining data.

The data for Brunei are from the early 1970s.

and 70.5% of those with some primary education had already married, but only 36.5% of those with some secondary education had married (Ahmed and Chaudhury 1981, cited in Martin 1987, 2).

Given this situation, it is worth reviewing the dramatic results of a USAID pilot project which provided secondary school scholarships to girls in two zones in Bangladesh (Shahrasti Upazilla, in Chandpur District and Gopalgonj Upazilla, in Gopalgonj District). Begun in 1982, the project had granted scholarships to over 6,000 girls by 1985. These were awarded **solely** on the basis of residence in the project areas. The stipends covered about one-half of a girl's annual total educational costs, including tuition, texts, supplies, uniforms, and rainy season transportation. In the Shahrasti Upazilla area, only 27.3% of secondary students were females in 1981, before the project. This rose to 43.5% by 1984, while dropout rates fell from 23.3% in 1981 to under 5% in 1984 (Ather 1983, 1984).

A remarkable shift in marriage patterns followed this increase in female education. In 1985, USAID sponsored a survey (Ather 1985) of four groups of girls matched on age (mean = 17.2 years, including both married and unmarried females): (a) 383 scholarship recipients who had completed secondary school; (b) 58 recipients who had dropped out; (c) 200 nonrecipients who had completed primary school only; and (d) 200 girls with no schooling. Only 30% of the secondary completers had married (at mean = 16.5), compared to 76% of the secondary dropouts, 77% of the primary completers, and 62% of those with no education. The average age of marriage was 15.8 for the secondary dropouts, 14.6 for the primary completers, and 14.7 for the uneducated.

Even the secondary dropouts, most of whom left for marriage, showed one crucial change in behavior - increased contraceptive use. Rates of contraceptive usage were 53% among secondary completers and 48% among secondary dropouts. This compared with usage rates of only 12% and 14%, respectively, among primary completers and those with no schooling. According to the 1983 Contraceptive Prevalence Survey (cited in Martin 1987, 3), 42.1% of Bangladeshi women with more than primary school used contraceptives, in contrast to only 21.0% of those with some primary education, and 16.0% of those with none.

Not just in Bangladesh, but throughout the developing world, female education results in a higher likelihood of using contraception. The World Fertility Survey found about 25% higher contraceptive usage among women with seven or more years of schooling (post-primary in most countries) than with those with no education (United Nations 1987, 214, 237). This brings us to what many consider the *key* education linkage for development.

4.3 The Relationship between Education and Fertility

The literature on this topic is enormous. Most of the studies find some kind of a negative relationship, although it may be non-linear, with slightly higher fertility found among those with

partial primary education than among those with no schooling (the peak seems to occur at about 3-4 years, per Cochrane (1979a, 36-39)). Until the recent publication of the full World Fertility Survey findings (United Nations 1987), Cochrane's was the "state of the art" review of the evidence (Cochrane 1979a).

4.3.1 COCHRANE'S SYNTHESIS

She found that females' education indirectly affects their fertility in three main ways:

- By affecting the "biological supply" of children,
- By lowering the demand for children,
- By increasing knowledge of contraception.

Education affects the "biological supply" of children by raising women's age of marriage and reducing the proportion who marry, thus reducing females' exposure to pregnancy. Conversely, however, education also tends to raise fecundity by improving health and by breaking down traditional post-partum abstinence taboos, particularly in Africa.

Education lowers the demand for children mainly via enhanced earnings and attractiveness of job prospects for educated women. Thus, their opportunity costs in raising children rise. More generally, the perceived benefits of more children diminish, while the perceived costs increase.

Education increases the knowledge of how to regulate fertility via contraception. This better enables parents to achieve fertility goals.

It should also be noted that Cochrane found an inverse relationship between schooling and number of children for the husbands as well. But this relation was weaker to begin with and was reduced greatly when income was held constant. In contrast, the relationship between women's schooling and fertility became **stronger** when income was held constant, indicating that it is not just a function of their economic position. In other words, within a given economic level, more educated women have fewer children than their less educated counterparts (Cochrane 1979a; LeVine 1980, S81).

These findings were tentative, primarily because of data limitations. The more recent final report on the World Fertility Survey (WFS) data (United Nations 1987) provides support for all three major patterns identified by Cochrane. In addition, it offers much needed clarification and more precise specifications via a series of multiple regressions.

4.3.2 MAJOR PATTERNS FROM THE WORLD FERTILITY SURVEY

The long-awaited WFS results show that education is strongly and inversely related to fertility in most countries, but the form and size of the relationship vary considerably. Findings are based on both Total Fertility Rate (TFR) and Children Ever Born (CEB; to women 40-49), and bivariate relationships include the following:[36]

- At current fertility rates, averaged over all countries, women with seven or more years of education will bear 3.9 children while women with no schooling will bear nearly 80% more, 6.9 on average. The effect of education is strongest in Latin America and the Caribbean—3.2 vs. 6.8 children for women with 7+ and 0 years of education, respectively. The effect is weakest for Africa—5.0 vs. 7.0 children for 7+ vs. 0 education. (ibid., 214; see also WFS Table 112, in the Appendix).

- The fertility differential by education has increased over time in many countries, due to greater fertility decline among the better educated.

- Although highly educated women generally have the lowest fertility, women with a few years of schooling often have slightly higher levels than those with no education, as found by Cochrane. This pattern is common in the least developed countries, and, regionally, in Africa. The inverse relation of education and fertility is stronger and more linear in the relatively more developed WFS countries.

- The contrast in the number of surviving children between the most and least educated women is considerably smaller than the contrast in number of births. This is due to the lower infant and child mortality among educated women. Averaged over all countries, women with seven or more years of education had 91% of their children surviving vs. 79% for women with no education. As a result, in the least developed countries, the number of surviving children is about the same—4.6—for women with 7+ vs. 0 years of education. Similarly, in tropical Africa, the region with the highest fertility, where the great majority of the least developed countries are concentrated, women with 7+ years of education had 4.4 surviving children, vs. 4.8 for women with no education (see WFS Table 113, in the Appendix).

- Comparing the impact of wife's vs. husband's education on fertility, fertility differentials by wife's education tend to be somewhat larger and less often curvilinear than with husband's education. In the Latin America/Caribbean region, husband's education is similar in pattern to wife's and almost as strong; in the other two regions, however, the husband's pattern is weaker and more curvilinear (i.e., wife's fertility is higher when their husbands have intermediate levels of education). In Africa, a woman whose husband has 7+ years of education has as many or more children than a woman whose husband has never been to school (see WFS Tables 112 and 114, in the Appendix, and Figure 4 below).

- Education differentials are similar in rural and urban areas of most countries, but in a sizeable minority, the education effect is larger in urban areas.

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[36] There is a lively literature on the biases, advantages and disadvantages of the various measures of fertility. Reviewing this literature is beyond the scope of this monograph, but a good discussion of TFR and CEB is found in the report on the WFS (United Nations 1987, Chapter I).

FIGURE 4

Mean Number of Children Ever Born to Ever-Married Women Aged 40-45 Years By Husband's and Respondent's Education and By Region

TABLE 115. MEAN DESIRED FAMILY SIZE FOR EVER-MARRIED WOMEN AGED 15-49, ACCORDING TO RESPONDENT'S EDUCATION,[a] BY COUNTRY AND AVERAGES BY REGION AND LEVEL OF DEVELOPMENT

	Desired family size, by respondent's education[a]				
	Zero (1)	*One to three years (2)*	*Four to six years (3)*	*Seven or more years (4)*	*Difference: (1) – (4) (5)*
A. *Country*					
Africa					
Benin[b]	7.7	6.5	5.6	5.1	2.6
Cameroon[c]	8.1	8.4	8.2	6.4	1.7
Côte d'Ivoire[d]	8.6	8.2	7.5	6.3	2.3
Egypt	4.5	3.9	3.5	2.6	1.9
Ghana[b]	6.5	5.8	5.9	5.2	1.4
Kenya	7.6	7.0	6.9	6.5	1.1
Lesotho	6.4	6.3	6.0	5.7	0.7
Mauritania[e]	9.0	8.6	7.1	6.0	3.0
Morocco[b]	5.1	4.0	3.9	3.4	1.7
Senegal[b]	8.5	8.3	6.7	5.0	3.5
Sudan[b]	6.5	6.1	5.4	5.0	1.5
Tunisia	4.3	4.0	3.6	3.2	1.1
Latin America and the Caribbean					
Colombia	4.7	4.2	3.8	3.5	1.2
Costa Rica	5.7	5.6	4.6	3.7	2.0
Dominican Republic	4.8	4.9	4.5	4.1	0.7
Ecuador	4.7	4.5	4.0	3.3	1.4
Guyana	5.0	4.6	4.9	4.5	0.5
Haiti	3.6	3.4	3.2	3.2	0.4
Jamaica	4.9	4.7	4.3	3.9	1.0
Mexico	5.0	4.8	4.3	3.4	1.6
Panama	4.6	4.9	4.4	3.8	0.8
Paraguay	5.9	5.8	5.0	4.1	1.8
Peru	4.1	3.9	3.7	3.4	0.7
Trinidad and Tobago	4.0	4.5	4.0	3.7	0.3
Venezuela	4.9	4.6	4.1	3.6	1.3
Asia and Oceania					
Bangladesh[b]	4.1	4.0	4.1	4.0	0.1
Fiji[c]	4.4	4.4	4.3	3.9	0.5
Indonesia	4.1	4.3	4.1	4.0	0.1
Jordan	7.2	6.3	5.9	4.7	2.5
Malaysia	4.6	4.4	4.3	3.9	0.7
Nepal	3.9	3.7	3.6	3.1	0.8
Pakistan[c]	4.2	3.7	3.6	3.3	0.9
Philippines	5.4	4.9	4.6	3.9	1.5
Republic of Korea	3.6	3.5	3.2	2.8	0.8
Sri Lanka	4.2	4.0	3.9	3.3	0.9
Syrian Arab Republic	7.0	4.7	4.7	3.9	3.1
Thailand	3.9	3.9	3.7	3.2	0.7
Yemen[b]	5.4	..	4.5	..	..
B. *Averages by region and level of development*					
Africa	6.9	6.4	5.9	5.0	1.9
Sub-Sahara[f]	7.7	7.2	6.6	5.7	2.0
Other	4.7	4.0	3.7	3.1	1.6
Latin America and the Caribbean	4.8	4.7	4.2	3.7	1.1
Asia and Oceania	5.4	4.3	4.2	4.0	1.4
I. High	4.7	4.6	4.2	3.7	1.0
II. Middle-high	5.2	4.7	4.3	3.7	1.5
III. Middle-low	6.4	6.0	5.8	5.0	1.4
IV. Low	5.9	5.5	4.9	4.3	1.6
Excluding Sub-Saharan Africa[f]					
III. Middle-low	4.5	4.1	3.8	3.4	1.2
IV. Low	4.2	3.7	3.6	3.4	0.8
TOTAL	5.4	5.1	4.7	4.1	1.3

Source: World Fertility Survey standard recode tapes.
NOTES: Means are adjusted for the effects of age differences between educational groups. Desired size not shown for cells containing fewer than 10 observations. Averages exclude values for such cells.
[a] Years of schooling completed.

Source: UN 1987, p. 228

- Within countries, desired family size is always lower for better educated women, but actual fertility differentials do not simply reflect desires. Women with 7+ years of education desired an average of 1.3 fewer children than women with no education. Differences in number of children desired were most strongly related to education in Africa, which is the opposite of the actual fertility pattern. In the least developed (largely African) countries, where the education difference in number of living children is minimal, older women with moderate to high levels of education are the most likely to have exceeded their desired family size. In the more developed countries, the proportion with excess fertility decreases with education.

- Regional (or cultural) differences in desired fertility are stronger than differences by level of development. Thus, women in most countries desire between three and five children; this rises to five to six in Western Asia, and six to nine in sub-Saharan Africa (see ibid., 48).

Turning to multivariate analysis, the great advance represented by the WFS permits more sophisticated specification of the education-fertility linkage. The regressions successively control for demographic variables such as age of marriage, rural-urban residence, and other socio-economic factors. Controlling only for the demographic variables, the fertility of women with ten or more years of education is about 1.5 children lower than women with no education. Adding controls for rural-urban residence reduces the differential to 1.1 children, and probably provides the best indication of the overall effect of female education on fertility.

In the regressions comparing the strength of effect of wife's and husband's education on fertility, wife's education proved stronger. The contrast was -39 births per 1,000 woman years of marriage for most vs. least educated wives, as compared with only -24 births for most vs. least educated husbands. In a number of countries, husband's education even had a significant positive relation with fertility.

4.3.3 SCHULTZ'S DATA ON THE EDUCATION-FERTILITY LINK IN THAILAND

In a study utilizing the 1981/82 Socioeconomic Household Survey (SES), 12,620 women between 15-49 were sampled. Schultz found that: "If the woman's education is one year higher than average, her fertility rate at the sample mean is 6.4% lower...A standard deviation change in education (3.4 years) is thus associated with a 21% change (inverse) in fertility" (Schultz 1988, 15; see also Table 1). Although Schultz later adjusts this figure downward due to an income effect that is not broken down by gender, this result gives an idea of the kind of impact that education can have in a population already undergoing rapid fertility decline, as is the case in Thailand. Between 1960 and 1980, Schultz reports (ibid., 1), total fertility rates in the country dropped 45%, while the country grew at a rapid 7-8% per year.

4.3.4 SOME SPECULATION ON HIGH FERTILITY IN AFRICA

Although fertility rates are clearly lower among the most educated African women (with seven or more years of education), many have puzzled over why most sub-Saharan African women *want* and *bear* so many more children than women in almost any other part of the globe. Other than to say that Africa is just at an earlier stage of the demographic transition, how can this state of affairs be explained? Several clues can be found in:

- The "spillover effect" of low literacy;
- The collapse of traditional post-partum sexual abstinence taboos among those with some education; and
- The horticultural, rather than agrarian, "techno-economic heritage" of Africa, which make it different in ways that may be relevant for fertility.

The "spillover effect": This refers to the effect that others' education, at the community or even national level, may have on individual women's and couples' fertility. Cochrane noted that: "If women in general have very little education, an educated woman can afford massive child care substitutes and thus can combine the benefits of education with high fertility" (Cochrane 1979a, 76). In general, in countries with high levels of illiteracy, the education-fertility inverse relationship is both weaker and more likely to be curvilinear. This fits the African situation.

The breakdown of traditional post-partum sexual abstinence taboos: The classic method of birth spacing in sub-Saharan Africa involves long periods of sexual abstinence after the birth of a child. Many have argued that the traditional system of polygyny (where men may have more than one wife) facilitated husbands' compliance with such a taboo. Wives were under strong communal pressure to maintain at least three year spacing between births, on the grounds that anything closer would endanger the health of the nursing child. Long lactation was the norm (see, e.g., Page and Lesthaeghe 1981). Women were further motivated to maintain widely spaced births because of their own strong tradition of economic activity in farming and, in many instances, trading. These are more easily accomplished if a woman does not have two tiny children to carry and worry about at the same time.

Empirical studies presented in Page and Lesthaeghe show that these traditional practices are breaking down, especially among those who are urban and/or have at least some education. They are not only less likely to observe long post-partum abstinence, they are breastfeeding for shorter intervals. The WFS data confirm this pattern. Moreover, urban/educated women are likely to be healthier and thus more fecund. Studies by Lesthaeghe, et al., (1981) and Caldwell and Caldwell (1981) conducted in the two biggest cities in Black Africa—Lagos and Ibadan, Nigeria—show that certain categories of women have begun to respond to this new situation by deliberate contraceptive practice. "The most important element in the characteristic profile of these women is that most of

them have reached at least a secondary level of education" (Page and Lesthaeghe 1981, 307). The problem is that so few African women attain it and only with this level of schooling is the association with fertility almost invariably negative.

The horticultural tradition: Nolan (1988) finds that a horticultural vs. agrarian "techno-economic heritage" has a direct effect on fertility in a sample of 57 societies. All of his horticultural societies, however, are in Africa, while the agrarian ones are scattered around Latin America, Asia, and the Middle East. He invokes ecological-evolutionary theory (developed by Lenski 1970; see Lenski and Lenski 1987 for the most recent version) to account for this pattern. Worldwide, women in horticultural societies typically play a much more important role in cultivation than their counterparts in agrarian societies.[37]

Nolan finds that contemporary "industrializing horticultural societies" have higher levels of child mortality, smaller service sectors, and larger proportions of their labor forces female than their industrializing agrarian counterparts. The first two features indirectly **raise** fertility, while the third indirectly **lowers** it" (Nolan 1988, 26, emphasis in original). His analysis controls for the above factors, as well as the level of development and family planning effort, but the regressions indicate that he has not specified all the factors pertaining to horticultural societies that account for their higher fertility.

The *patrilineality/patrilocality* of most African horticultural societies is one such additional element that should be taken into account. Even educated, urban women are only minimally integrated into their husband's patrilineage and have a tenuous relation to resources within their own. Investing in children may be seen as a rational and, indeed, best strategy if the woman has few other sources of assistance for crises and old age. Cain, et al. (1979) have found this for Bangladesh as well. If urban women still can count on "massive child care substitutes," then their fertility is facilitated. And rural women may have even stronger incentives for high fertility than their urban counterparts—their need for labor as well as old age/crisis help.

Combining these explanations with some of the constraints on female horticultural cultivators, reviewed earlier, provides the following possible scenario. First, the fact that the WFS found that even the most educated category of African women desired 5.0-6.5 children (United Nations 1987, 230), while African women with no education wanted 6-9, needs to be disaggregated by rural/urban. Although fertility differentials are not great between rural and urban areas, women's reasons and incentives for observed patterns (as mentioned above) may differ.

Less educated rural women farmers may want high fertility because of the high perceived cost-benefit ratio. With more of their children in school and so many of the men migrating, extra

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[37] This is particularly the case if horticulture is being compared to rainfed (dry) agrarian cultivation; irrigated agrarian cultivation, especially of wet rice, is so labor-intensive that everyone works (Blumberg 1978, 1981, 1984).

children are useful, from a remarkably early age, for everything from caring for younger siblings, to fetching water and fuelwood and helping with many farm tasks. The future cost-benefit ratio is also expected to be positive. Rural women with more education presumably would not have many non-farming, non-trading economic opportunities that might prove incompatible with high fertility—and they, too, have a positive cost-benefit ratio and ample child-care substitutes.

Second, even African urban women are infrequently found in modern occupations that are incompatible with high fertility (discussed in 4.6 below). **Uneducated** women are likely to be in the informal sector and thereby have a positive perceived cost-benefit ratio for children. Urban women with **some education** are most likely to be caught in the situation described by Page and Lestheaghe—their fertility enhanced by a reduction in breastfeeding and post-partum abstinence without a corresponding increase in contraception. Urban women with **high education** may want fewer children than their less educated counterparts but because they still can find abundant child-care assistance and find children an effective hedge against the vagaries of the patrilineal system for future support, they may continue to want more of them than in other regions.

It must be stressed that, even in Africa, fertility is almost invariably lower among women with the most education. Over all 38 WFS countries, women, more than men, "show an overall pattern of decreasing fertility with increasing education...[indeed, i]n roughly 40% of the countries with available information, women with seven or more years of schooling will have under half as many children as women with no education at current rates of childbearing" (United Nations 1987, 248).

Given that Hess (forthcoming) found "strong evidence that reducing fertility contributes to economic growth in contemporary LDCs" (ibid., 174), it is not only women's lives that stand to be enriched when education opens up life options that reduce their needs for high fertility. The final results are societal. As Hess traces the process, "lower fertility can 'free up' resources (including expenditures that would have been used for capital widening and social welfare maintenance) for human and physical capital deepening. The consequent capital formation combined with a labor force that, for at least a decade, is no smaller and likely larger, can increase national output" (ibid.). His data base (49 countries for two time periods encompassing the 1960's and 1970's) shows that there was a statistically significant increase in real per capita Gross Domestic Product when the total fertility rate fell (ibid., 173).

4.4 The Link Between Education and Lower Infant and Child Mortality

The evidence indicates a strong relationship between mother's education and the survival rates of her children. But why should this be so? LeVine (1980) proposes a provocative explanation. In most developing countries, he notes, a girl is socialized:

> ...to take [her] place at the bottom of a family hierarchy in which she follows parental commands, rarely seeks the attention of adults, and does not expect her expressed thoughts or feelings to be taken seriously by them. Participation in the school classroom represents entry into a new world of values and becomes a form of assertiveness training...The consequences of this training in adulthood...is a greater tendency to take one's own opinions seriously, act upon them, believe in the efficacy of one's own actions and refuse to be intimidated by others. Additional years in the classroom [enhance these effects]. This leads educated mothers to pursue the health and survival of their children (a traditional goal) more persistently and with greater determination than women of the same age with less schooling (LeVine 1980, S85-S86).

4.4.1 COLCLOUGH'S OVERVIEW: SETTING THE STAGE

His (1982) review of the literature showed that:

> With regard to data relating to up to 29 developing countries, both bivariate analysis (Cochrane 1979a) and multivariate studies (O'Hara 1979) show that infant and child mortality are lower the higher the mother's level of schooling. The evidence indicates that a wife's education has a larger total effect on mortality than that of her husband, but that the combined effects of both parents being literate (as compared to having no schooling) may be such as to reduce mortality by up to 27/1000. Finally, there is evidence that maternal education not only reduces child mortality, but also improves the health of the survivors: children of more schooled mothers tend to be better nourished (Colclough 1982, 179).

4.4.2 THE WFS DATA

We have already seen that women with higher education have more surviving children. In the least developed countries—particularly in Africa—this so flattens out the educational differential in number and percentage of children living at the time of the interview that the mean number of living children is actually highest for women with intermediate levels of education (1-6 years) (United Nations 1987, Table 113, 227). Averaged over all 38 countries, the WFS found that: "Among women aged 40-49, those with seven or more years of schooling average 2.2 fewer children ever born than women with no education, but the difference in number of children living is only 1.0" (ibid., 249).

4.4.3 CALDWELL'S RESEARCH AMONG THE YORUBA OF WESTERN NIGERIA

According to Caldwell (1979), although little attempt has been made to explain the observed negative relationship between maternal education and infant/child mortality, it frequently seems to have been assumed that mother's education merely reflects the standard of living (ibid., 396; see also LeVine 1980, S84, from which much of this discussion is taken).

Caldwell challenges the validity of this assumption. In a large-scale research project among the Yoruba in Western Nigeria in 1973, he and his associates sampled 6,606 women in Ibadan and another 1,499 in surrounding areas. They found that there was an inverse relationship between education of the mother and infant/child mortality within age/socioeconomic groups. For example, among females 40-49 years of age, 29.6% of the children of mothers with no education were reported to have died, compared to 24.8% of the children of mothers with primary education, and only 11.8% of those of mothers with some secondary schooling. Younger women had fewer children who died, presumably because health facilities had improved over time. But within each age category of women the inverse education-child/infant mortality relationship emerged. Depending on the age cohort of the mother, the life expectancy of a child whose mother had some secondary education was between 10 and 17 years greater than the child of a woman who had never been to school.

Caldwell finds that these differences in child/infant mortality by mother's education are not related to more educated women's better material circumstances. For example, the link between mother's education and child's mortality remains strong even among the wives of high status men, with secondary education and white collar occupations. Not even ease of access to health facilities and area of residence were important predictors of child/infant mortality in comparison with mother's education. Caldwell concludes that, "in terms of child mortality, a woman's education is a good deal more important than even her most immediate environment" (ibid., 405).

Caldwell's analysis included five control variables. Even with all five controlled, the inverse relation between mother's schooling and child's mortality emerged, "so that children of mothers with secondary schooling average little more than half the chance of dying than children with mothers similar in terms of the other five characteristics but who have not had any schooling" (ibid., 407).

Caldwell concludes that maternal education is, by far, the single most powerful determinant of a child's survival chances, and that: "Clearly maternal education cannot be employed as a proxy for general social and economic change but must be examined as an important force in its own right" (ibid., 408).

4.4.4 LEVINE'S RESEARCH IN URBAN MEXICO

LeVine (1980, S85), who presented the above synopsis of Caldwell's work in a paper describing his own research on maternal education and behavior among the Gusii of Kenya, later studied the same topic in central Mexico (LeVine et al. 1987). He conducted the research in a state capital with over 200,000 inhabitants. The sample included 300 women (294 in the final analysis) who: (a) had 1-9 years of education, (b) had a child under 48 months, and (c) lived in

either a poor squatter settlement on the outskirts of town (N = 73/294) or the crowded *vecindades* (one-room flats sharing courtyards and toilets) of the central city (N = 221/294). The mean age was 25 and the mean number of children was 2.5 and rising.

There had been only 15 child deaths among these 294 mothers; 10 of them involved the 73 mothers in the squatter town. Part of the reason for the high death rate in the shacktown was exposure to risk combined with limited access to health protection. For example, this shacktown lacked most urban services found in the *vecindades*, was far from the municipal general hospital, and had poor sanitation and water supply. In contrast, the inner city neighborhood was within easy walking distance of the hospital. In addition, 66% of the inner city mothers had access to one of the government social security clinics (which provide the best public medical service), compared with only 45% of the mothers from the squatter settlement.

Nevertheless, maternal education still proved to be important in both locations. Not one of the 15 child deaths occurred to mothers with more than six years of schooling. More educated mothers were generally more pro-active about children's health. First, even before their baby's birth, educated mothers were more likely to seek health services: regression analyses in both the shacktown and *vecindades* samples showed that mother's education was a significant predictor of prenatal care even when other household variables were controlled—including social security membership (which gives access to the government-run healthcare/hospital system). Second, more educated mothers were more likely to seek quick health intervention for a sick baby: among the mothers whose infants had had a serious health crisis in the preceding month (e.g., fever, vomiting, diarrhea), those with at least six years of education were significantly more likely to take their child to a clinic within three days of the onset of symptoms.

In this study, few of the better educated wives (6-9 years of schooling) earned any money because they had married men who were in a position to enforce the traditional *machista* norm that the wife remains in the home. In contrast, a significantly larger number of the least educated women were earning income. They worked mostly in the urban informal sector as laundresses, street vendors, domestic servants, etc. Given that these jobs are not incompatible with high fertility and that the expected cost/benefit ratio of children is often found to be positive for poor urban informal sector workers, it should not be surprising that these uneducated women had higher fertility than the more educated mothers who did not work.

In exploring the consequences of female production/income under the woman's control, section 2.2 presented data on a sample of Mexico City outworkers' whose decision-making power on fertility was substantially related to the proportion of the household common fund that they provided. In contrast, in LeVine's sample, the better educated women not only were unlikely to contribute *any* income, they also were at a relative disadvantage vis-a-vis their husbands even with respect to education—they married men with very significantly better educations than their own.

Thus, it is not surprising that among such women over 25 years of age, husband's education proved much more strongly correlated with fertility than the wife's. Nevertheless, when the husband's schooling was controlled, wife's fertility was still significantly correlated with her education—she still had some impact on her own fertility.

In short, the fertility of a better educated woman, who is not likely to work but is likely to marry a man with the educational and financial resources to enforce the cultural ideal of male domination, depends more heavily on what her husband wants than her own level of schooling. Without the clout that independently controlled income gives, these women are less likely to realize their own fertility objectives if they conflict with their husbands'. But these women are not powerless; their education also "counts."

4.4.5 A FINDING FROM ROSENZWEIG AND SCHULTZ'S RESEARCH IN INDIA

They found (1982) that the survival rate of female infants in relation to male babies was higher in areas where there were better employment opportunities for adult women. In other words, we can disaggregate infant mortality by gender. In doing so, we find that female infant mortality is associated with mother's education and the overall economic opportunities for women in an area. Where these are high, girl babies receive better care.

4.5 Women's Education and Child Health/Nutrition

LeVine argues that more self-confident, assertive, educated mothers pursue their children's health and survival (including nutrition) more relentlessly than less educated women (LeVine 1980, S86). Colclough's literature overview (1982, 179) also showed that mother's education improved the health of surviving children, who tended to be better nourished.

Providing further corroboration of the maternal education-child nutrition link is a study by Behrman and Wolfe (1984), whose title is quite germane to the points made in this monograph: "More evidence on nutrition demand: [household] income seems overrated and women's schooling underemphasized" (1984). The fact that they found household income overrated is in line with the findings presented in section 2.2 on the greater weight of mother's—as opposed to father's or household—income on child nutrition. Also, given the mother's much more direct role in food selection and preparation, her increased education would be expected to translate more directly into better child nutrition. These findings, no doubt, will be often replicated once studies begin to disaggregate by gender.

Thus far, however, such disaggregation by gender is uncommon. Many studies merely note that *both* parents' education affects child nutrition, without discussing the relative impact of mother's vs. father's schooling. One such case is Senauer's studies of mother's estimated wage and intrahousehold food allocation and children's nutrition, presented in section 2.1. He and his

associates also found that "both the mother's and father's education level had a positive impact on their children's long-run nutritional status. The children whose mothers and fathers had more years of schooling suffered less stunting" (Senauer 1988, 19).[38] This conclusion contrasts strongly with his results involving income, which showed that increased mother's income **helped** children's nutrition but increased father's income **hindered** it.[39]

4.6 Education as a Determinant of Women's Labor Force Participation

It is important here to distinguish between the standard, census-type measurements of the labor force, and the more expanded definitions that have begun to appear in the literature in the last decade (e.g., ILO 1977; Dixon 1982; Anker 1983). The standard approach emphasizes work for wages in the formal sector and places various methodological restrictions on counting many of the forms of economic activity in which women are most likely to be engaged (e.g., unpaid family labor, income generated in the informal sector). The more expanded definitions incorporate these activities. When only the standard measures are used, women's labor force participation is often strikingly undercounted.

4.6.1 THE UNDERCOUNTING OF WOMEN IN STANDARD NATIONAL STATISTICS

As a first example, census takers may ask a woman for her "primary occupation" in a Latin American country where she is culturally constrained to answer "housewife"—even if she has a strong role in the household's farming operations or engages in various informal sector income-generating endeavors. Deere (1977) analyzed census data for the Cajamarca, Peru, area. When women were first asked about their principal occupation, a majority identified themselves as "housewives"—a status not classified as part of the labor force. But when women were first asked about their income-generating activities, a majority of rural women reported themselves as economically active. A thorough analysis of the shortfall in counting female labor force participation in Latin America due to problems of this sort is undertaken by Wainerman and Recchini de Lattes (1981). In fact, they estimate that the undercounting of economically active women may be most severe in Latin America.

As a second example, in a survey in Kenya in 1974, the percentage of women (aged 20-49) counted as being in the labor force varied from 20% to 90%—depending on whether respondents were asked about a "job" (eliciting the 20% response) or "work" (producing the 90% response) (Anker 1983).

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[38] Strauss (1987) also concluded that both parents' education level had a significant positive impact on child's nutritional status.

[39] This brief discussion of the link between mother's education and child's health/nutrition is far from definitive. It was not possible, given the time constraints involved, to delve more deeply into the literature on this topic.

As a third and final example, the 1981 Peruvian National Census included unpaid workers in the labor force only if they worked 15 hours a week or more. No such hours test was applied to paid workers. In contrast, the 1985-86 Peruvian Living Standards Survey (PLSS) randomly sampled 5,648 women, aged 20-59, in urban and rural households. It defined "labor force participation...as any amount of work in paid *or* unpaid employment" (King 1988, 10). Accordingly, the 1981 Peruvian census recorded a female labor force participation rate of only 21%, while the PLSS counted 55% of women in the labor force.

4.6.2 RAM'S REVIEW OF GENDER DIFFERENCES IN THE EDUCATION-LABOR FORCE LINK

Ram (1980) presents a summary of the literature on "labor market situations involving wage or salary payments." Ram's point of departure is the "human capital framework" prediction that women's education should be (with some exceptions) directly linked to their market-participation rates. This is based on the premise that education raises the market earning power (potential wage) for both genders, and thus provides a stronger incentive for them to seek market work. He also presents Standing's (1976) approach, within the "discrimination framework," that proposes the "sexual dualism" hypothesis. This proposition "suggests that a dualistic structure of the labor market could result in education having different effects on the market-activity rates of men and women" (Ram 1980, S63).

Turning to the data, Ram establishes that for men, the education-labor force participation link is positive in both developed and developing countries. For women, he sees it as positive for women in the United States and possibly in other high income market economies. In the developing world, the picture is much more complicated. Although there is a tendency for the female market-participation rate to increase with education, there are numerous exceptions and other variables that must be taken into account. Moreover, he found, "in several cases, that the relationship between education and female participation rate seems to be 'curvilinear' in the sense that at low levels of schooling (e.g., a change from illiteracy to bare literacy) the effect of education on female market-activity rate is small or negative, while at somewhat higher educational levels the effect is more clearly positive" (ibid.). Otherwise, he found that the effect of women's education on their labor force participation rates (LFPR) seems to vary with rural-urban residence, marital status, presence of children, and husband's or family's income.

4.6.3 KING'S STUDY OF FEMALE LABOR FORCE PARTICIPATION IN PERU

Her paper (1988) begins with a review of five recent studies that have estimated labor force participation equations for Latin American women. One principal finding is that education has a positive impact on the female labor force participation rate (LFPR). In four of the studies, the relationship rises with education, although in a nonlinear fashion. But in the fifth (Castaneda 1986,

on Chile), a strongly U-shaped relationship emerges—women with more than 13 years of education and those who have no schooling are more likely to participate in the labor market than those with primary and secondary education. In three of these studies, young children (in one study, under age 3; in another between 1 and 2 years old) have a strong negative impact on women's LFPR (e.g., one more toddler, age 1-2, in the home reduces a mother's LFPR by 27%).

Of the 5,648 women in King's sample (that of the Peruvian Living Standards Survey), 31% lived in Lima, 37% in other urban areas, and 32% in rural areas. Using the expanded definition of labor force participation mentioned above (any amount of work in paid or unpaid employment), King finds that the overall participation rate was highest in the rural areas—at 85%. The rate was lowest in Lima at 64% and intermediate in "other urban areas," at 68%. In short, 70% of the women in the total sample were in the labor force. The breakdown between paid and unpaid work is particularly relevant:

> But, whereas 71% of employed Lima women reported receiving compensation for their work, only 30% of employed rural women were paid workers while the rest reported themselves as unpaid workers. Hence, although 84% of rural women were employed during the survey week, we observe wages, salaries, and/or payment in kind for only 25% of them. [Moreover], 60% of the paid workers in our sample are **self-employed**. [Geographically, 60% of paid workers in Lima are salaried, as are 35% of those in other urban areas and only 15% in rural areas. The rest are self-employed—and in the rural areas, almost 70% of the self-employed work in agriculture.] This suggests the overwhelming importance of own and family enterprises as a source of employment for women, particularly for those residing in rural areas. Private sector employment is most important in Lima [70% of the 60% who are salaried work in the private sector; this is more than five times as many as in rural areas] (ibid., 11-12).

Turning to the relation between education and full labor force participation, we find that the mean education of those **in** the labor force is lower (5.0 years) than that of individuals **outside** of the labor force (6.6 years of schooling). This is due to the fact that rural women, who are the least educated, have much higher participation rates at all ages than urban women.

If we confine our attention only to paid workers, however, we find that remunerated workers have higher education (6.3 years) than unpaid workers (3.4 years). Much of this gap is due to more rural women engaging in unpaid work. In fact, in rural areas, where only one-fourth of the labor force is in paid employment, an additional year of schooling has the greatest effect on the probability of being a paid worker, increasing it by 2% (ibid., 28). This is calculated at the mean schooling level of about 2 years in rural areas.

Another noteworthy finding is that having a diploma greatly increases the likelihood of paid employment (vs. overall labor force participation, as measured in this study). Women in urban areas outside Lima increase their chances of paid employment by 27% with a diploma, and women in rural areas are 21% more likely to work at a paid job. Finally, King found that being married

decreases the likelihood of paid employment for women by about 10%. Paid employment, which typically has fixed hours and is done away from home, may be less compatible with childcare and domestic tasks.

All the studies from which Ram and King drew their inferences about the relationship between labor force participation and education were based on single countries. Synthesizing these findings is problematic because of noncomparable measurements of labor force participation, measures of education, and selection/measures of other variables included in the research. What sort of patterns emerge when we look at the 38-country sample of the World Fertility Survey? As in the case of the education-fertility link, we can take a large stride forward because "all the data come from the same drawer."

4.6.4 WOMEN'S EDUCATION AND EMPLOYMENT: THE VIEW FROM THE WFS

Noteworthy here is the WFS approach to increasing the precision of the labor force participation measure. This is part of the push to measure full labor force participation, noted earlier, by including unpaid family labor, especially in agriculture, and by eliciting women's informal sector income-generating activities.

The results of an expanded labor force definition are commendable from many perspectives. But including so many more activities that seldom require educational qualifications raises the possibility that the new measure will be inversely related to education. This is precisely what occurred in King's study: due to the broader labor force definition used, the mean educational attainment of those in the labor force is lower than of those out of it: by -1.6 years for the whole country (-1.3 years in Lima, -1.1 years in other urban areas, and -0.9 years for rural women) (King 1988, 14). King resolved this problem by differentiating between the paid and the unpaid labor force. The WFS takes another tack—a dual-faceted approach including: (1) a broad definition to ascertain if a respondent is currently working, and; (2) a recoded version of the standard categories of the international occupational code.

A broad definition of "work": The standard question in the WFS questionnaire, used to ascertain if a respondent is currently "working," is:

> As you know, many women work—I mean aside from doing their own housework. Some take up jobs for which they are paid in cash or kind. Others sell things, or have a small business or work on the family farm. Are you doing any such work at the present time? (United Nations 1987, 258).

The data generated by this query show strong regional contrasts:

- In Latin America/Caribbean, 23-68% of women were currently working. In Asia and Oceania, the range is wider, from 11% in Jordan to almost 85% in Thailand. And the average is somewhat higher at about 45%. In Africa, the variation in labour force participation is also very broad; the percentage of women currently working ranges from 18 in Egypt to over 90 in Ghana. In addition, the level of women's work was consistently

> low in countries with a predominantly Muslim population, such as Bangladesh, Egypt, Jordan, Pakistan, and the Syrian Arab Republic, where cultural restrictions that discourage women from doing most types of work are common (United Nations 1987, 259).

With the use of this broad definition of work, the WFS data reveal that a relationship between education and labor force participation does, in fact, exist. "The data strongly suggest that labour force participation among women is highly correlated with education" (ibid., 262). But there actually are three major variations among the 38 countries (shown in Figure 5).

The first, and most typical, is the pattern where work is curvilinearly related to education. In most of the WFS countries, the most highly educated women and those with no education are most likely to work, while women in the middle educational categories are least likely to do so. This pattern is represented by Senegal in Figure 5.

The second major pattern is where the most educated women are by far the most likely to work. The percentage of women with no education who work is only slightly higher than that of women in the middle categories (illustrated by the Dominican Republic and Jordan).

A third variation involves a few exceptions (e.g., Cameroon, Nepal, and the Republic of Korea), where participation declines with increasing education.

Revision of the international occupational code categories: As a second tack, the WFS report has reordered the standard Edwards-type categories of the international occupational code into four occupational subgroups: (1) Modern (professional, clerical); (2) Transitional (domestic household employee, service); (3) Mixed (skilled, unskilled, and sales); and (4) Traditional (agricultural). The object of this regrouping is to better delineate the relationship between education and the sort of labor force participation that, presumably, would be most enhanced by it—paid occupations in the modern formal sector.

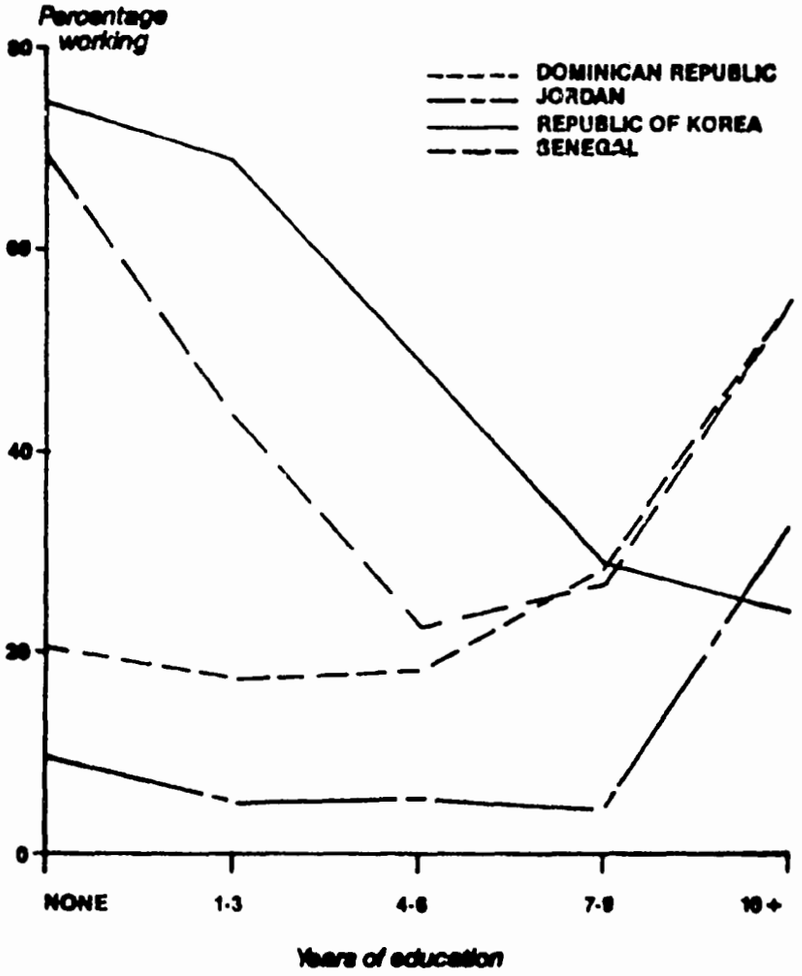
According to Cochrane (1979a, 76), such jobs have two important characteristics: (1) they are "more attractive" in the sense that, "the more attractive a job, the higher the satisfaction derived and the higher the benefits from work" (ibid.); and (2) they are likely to be less compatible with childrearing. Often this is because these jobs are done outside the home in a setting to which one cannot bring children and/or they have irregular and frequently heavy time commitments. Comparable data should be available for future studies from virtually any one-digit (or more detailed) coding of occupation.

From the standpoint of the theoretical literature on women's labor force participation, the only major problem with this recoding of occupational categories is that the "mixed" category blurs the formal and informal sectors and combines manufacturing labor with other kinds of jobs. Women's labor force participation in export-oriented manufacturing jobs is an increasingly important variable

FIGURE 5

Current Work, By Years of Education—Selected Countries

Figure 70. Current work, by years of education, selected countries



Source: World Fertility Survey standard recode tapes.

Source: UN 1987, 262.

to capture—and a type of employment that is associated with above average education in export processing countries (see, e.g., Jockes 1986). But the WFS coding places it in a "mixed" bag of jobs.

Caveats aside, how does the recode function? While the "modern" category of occupations, by definition, requires some education, the text of the WFS report does not give the bivariate relationship between education and these occupational codes. One education-occupation-fertility causal chain is shown, however, in the WFS report (United Nations 1987, Fig. 73, 271). It is reproduced here as Figure 6. This WFS figure:

> ... shows that, in general, where a large proportion of females are in school, the relationship between modern sector work and the rate of childbearing is more strongly negative than in countries where the school enrollment of females is low (ibid.).

This pattern of results implies a chain of effects leading from education to modern occupations to lower fertility. As one would expect, this chain is strongest in relatively more developed societies with more modern occupations into which to convert education. The WFS chapter conclusion is that: "Perhaps the most important finding is that the relationship between occupation and fertility appears to be strongest in countries at higher levels of socio-economic development" (ibid., 277).[40]

For the purposes of the present monograph, the WFS report does not probe the causal links between education and types of occupation in sufficient depth. Still, the WFS findings detailed above provide general support for the sorts of individual studies on women's education/work summarized by Ram and King. They also resolve some of the contradictions in this literature by showing the predominant patterns. These show that the relationship between education and work is almost always U-shaped or positive with an expanded definition of work; but it is clearly positive with modern/paid jobs. The next step—were the WFS tapes made available—would be to deepen the analysis and attempt to relate the empirical patterns to theoretical debates about predictive models for these factors.

4.7 Education and Earnings: An Incomplete Sketch

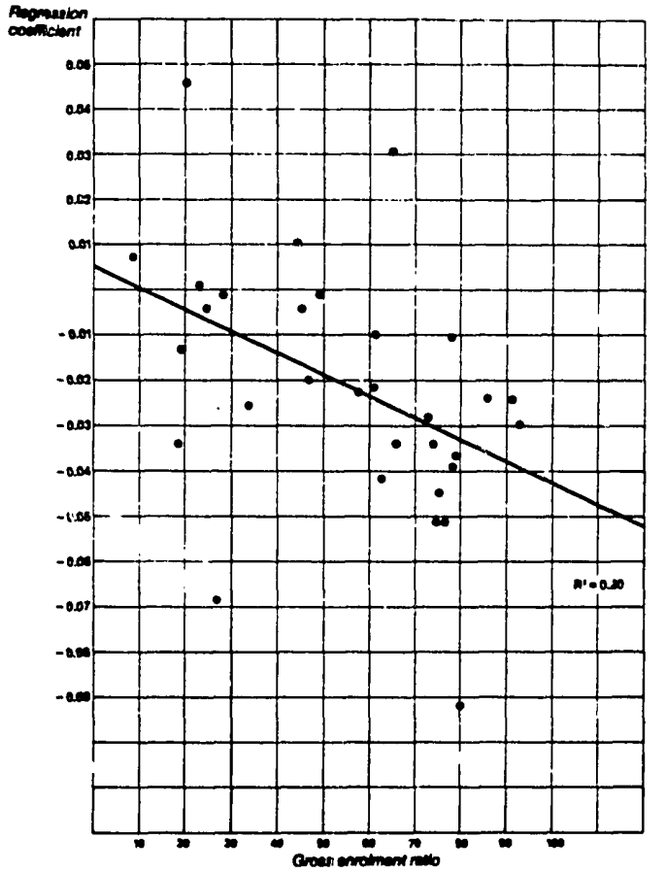
In two of the best-known syntheses of the literature on economic returns from investment in education, Psacharopoulos (1973, 1980) calculated the private and social rates of return by educational levels in less developed countries. In every case, he found that the private rate of

[40] In countries at lower levels of development, the WFS data revealed that women who work in the modern sector tend to have lower fertility than women who work in the agricultural sector or not at all, but the magnitude of the differentials was rather small. Nonetheless, these differentials were significant in 24 of 31 countries. The multiple regressions indicated that, net of other variables, women in modern occupations bore, on average, about 0.5 child less (after 20 years of marriage) than women who did not work, according to the WFS definition (United Nations 1987).

FIGURE 6

Partial Regression Coefficients of Variable Indicating Work In a Modern Occupation, By Gross Enrollment Ratio for Females, 1975

Figure 73. Partial regression coefficients of variable indicating work in a modern occupation, by gross enrolment ratio for females, 1975



Sources: For gross enrolment ratio, United Nations Educational, Scientific and Cultural Organization (1980); for regression coefficients, table 131 based on World Fertility Survey standard recode tapes.
NOTE: Enrolment ratios for the Dominican Republic and Haiti are for 1974 and 1970, respectively.

Source: UN 1987, 271.

return was higher than the social rate. He also found that the rate of return for primary education was dramatically higher than the returns for either secondary or higher education.

Unfortunately, Pscacharapoulos' work on returns to education by gender is considerably less complete. Although Ram (1980) has combined Psacharopoulos' findings (1973) with those of Woodhall (1973) in a table (Ram 1980, S72) that encompasses six countries, he does not provide enough comparable cells to draw firm conclusions. Also limited is Colclough's review of the evidence on the impact of primary schooling, which presents only the following mention of gender, education, and earnings:

> There is some evidence from the urban informal sector in Colombia that earnings differentials by education among age-sex groupings are substantial—although rather less than are found in the formal sector (Bourguignon 1979; Kugler, et al. 1979; cited in Colclough 1982, 177).

The study by King (1988) provides a one country insight into women's rates of return for education in Peru. Among employed women, education is positively related to hourly earnings; the relationship is nonlinear, with primary education showing higher returns than secondary education. The return to post-secondary education appears low and negative, except for the small fraction of women who have earned a diploma. King interprets the lack of return to tertiary education, in part, due to the poor performance of the Peruvian economy over recent years.

A final example of another study that examines only women's rate of return to education is that of Schultz. Using the 1981/1982 Thai Socioeconomic Household Survey (SES), he encountered 4,000 women who received a wage or salary. His analysis of returns to education is as follows:

> **Thailand:** Among the four thousand women [wage/salary recipients], an additional year of schooling is associated, on average, with a 26% increase in their hourly wage, similar to the proportional effect of education on wage rates of men. This rough approximation for the private rate of return to schooling (Mincer 1974) for women in Thailand may require adjustment, for those who receive wages may not be representative of the entire population. Following Heckman's (1979) approach, but using a more efficient maximum likelihood estimation technique, adjusted estimates of the wage function for women still imply that an additional year of schooling is associated with a 20% increase in wages. However, these private returns to schooling for Thai women are not uniform across education levels. This selection corrected measure of private returns to schooling [is] lower than average at the primary level, or 15%, and higher than average at the secondary level, or 40%. The sample selection correction procedure has its largest effect on the estimates of returns to higher education, where the uncorrected return is 11% and the corrected return is statistically insignificant and near zero (Schultz 1988, 4-5).

In essence, Shultz's low returns to tertiary education echo the situation found by King in Peru, while his findings that secondary education provides a higher return contradict those of King. Two studies confined to females, however, do not provide a basis for firm generalizations. Further literature review might turn up additional, quite recent studies (Ram and Colclough both indicate that such research was rare in their respective 1980 and 1982 overviews). But, for the moment, it is not possible to make further conclusions.

4.8 Some Preliminary Regressions Involving Male/Female Disparities in Educational Access

The Basic Research and Implementation in Developing Education Systems (BRIDGES) project now underway, jointly involving Harvard and the Research Triangle Institute, has generated a preliminary data set encompassing 52 countries. It focuses on two measures: (1) the extent to which a country has provided access to education to its school age population (this is measured by the Gross Enrollment Rate (GER)—roughly the proportion of the age cohort in school, a figure that can be swelled to over 100 by the presence of repeaters); and (2) the extent to which, within whatever the GER may happen to be, there is parity between male and female enrollment (a variable known as the "Disparity" measure).

For the purposes of the present monograph, preliminary linear regressions have been run with the Gross Enrollment Rate for Females (GERF), and the Disparity Index (indicating the proportion of girls to boys within whatever students are enrolled at a given educational level). Moreover, a new index has been created, combining the GER and Disparity measures. Known as "UTILDIS," it is defined as: UTILDIS = 0.5*Ln(GER/100) + 0.5*Ln (abs(DISIND)).

At present, these regressions have been run only for primary education. The absolute value of the Disparity Index (DISIND) is used because there are three cases among the 52—Jamaica, Botswana, and Lesotho—where the disparity involves more girls. In this way, the cases were not dropped, and the variable may be considered a bit more conservative than it might have been with only disparity cases favoring males included. The GER measure used is also conservative—it includes total, rather than female, enrollment.

In interpreting these regressions,[41] it must be borne in mind that, when more complete models are run, the strength of any of the relationships seen above could be diminished—or further enhanced—by the addition of other variables to the equations.[42] Moreover, it will be important to correct the present regional disequilibrium represented by the 52 countries: currently, there are 29 tropical African countries, 9 Latin American/Caribbean countries, 5 Middle Eastern (North Africa/West Asia), 5 South Asian, 2 Southeast Asian, and 2 Oceanian. The disproportionate number of African countries—most of them at fairly low levels of development—strongly affects the relationships observed.

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[41] The results must be interpreted with caution as the data were run without full checks to correct any possible clerical errors (e.g., Madagascar shows a Gross Enrollment Rate of 148; ideally, it would have been desirable to check the input data for such an outlier). As an additional caveat, these, of course, are only single factor regressions.

[42] At some point soon, it should be possible to generate a model of the antecedents and consequences of the female/male disparity in educational access, and run appropriate multivariate regressions. Prior to doing so, however, it is desirable to add some of the variables that have been shown to be importantly linked to education (e.g., females' age of marriage) that are not included in the current data set.

Table 9: Regressions of Three Measures of Female Educational Access/Disparity

	R^2	F	p
1. Gross National Product per Capita			
GERF	.278	19.217	.000
DISIND	.209	13.241	.001
UTILDIS	**.396**	**37.782**	**.000**
2. Total Fertility Rate (TFR)			
GERF	.169	10.178	.002
DISIND	.114	6.406	.015
UTILDIS	**.275**	**18.956**	**.000**
3. Female Infant Mortality Rate			
GERF	.543	58.255	.000
DISIND	.514	50.917	.000
UTILDIS	**.617**	**78.901**	**.000**
4. Male Infant Mortality Rate			
GERF	.520	53.045	.000
DISIND	.474	44.191	.000
UTILDIS	**.605**	**75.169**	**.000**
5. Total Infant Mortality Rate			
GERF	.551	61.250	.000
DISIND	.499	49.860	.000
UTILDIS	**.626**	**83.674**	**.000**
6. Size of Female Longevity Advantage (if any)			
GERF	.077	4.159	.047
DISIND	.128	7.330	.009
UTILDIS	.062	3.333	.074
7. Rural			
GERF	.060	2.759	.104
DISIND	.100	4.672	.036
UTILDIS	.093	4.407	.042

Source: Preliminary regressions on BRIDGES data set, run by Scott Moreland, Research Triangle Institute, and Rae Lesser Blumberg, University of California, San Diego.

Still, these results tell us that the more developed countries among the 52 have more gender-egalitarian access to their schools (#1 in Table 9). It is quite relevant that the combined index of access/gender disparity (UTILDIS) has by far the strongest relationship (40% of the variance was explained, according to the R^2 statistic). This tells us that the most developed nations in the data set have both: (1) improved educational access (enrolling a higher proportion of the eligible age cohort), and (2) narrowed the gap between the proportion of boys and girls in their primary school system. Normally, one would see GNP per capita as the independent variable in the bivariate relationship with female educational access and disparity. However, the argument in this monograph, concerning the positive impact of educating women, implies that the relationship is actually synergistic—and that the girls, once educated, will respond in ways that further enhance their country's growth. Additional data and procedures (e.g., using lagged variables) will be needed to document such a case.

The relationships involving infant mortality (#3 in Table 9) are much stronger than the GNP/capita-gender access/disparity link. The combined UTILDIS index explains over 60% of the variance for female, male, and total infant mortality rates. Clearly, countries in which girls' schooling is more prevalent and less discriminatory have considerably lower rates of infant mortality. Is this an indication that countries that value females more, as reflected in the amount of education that they receive, also produce women who are more capable of keeping their babies alive?[43] It is also possible that countries which better incorporate girls into their school systems have a stronger commitment to health in general and maternal/child health programs in particular. These, too, are known to reduce infant mortality. At present, none of the variables are lagged; all the data in the regressions come from approximately 1985. So more sophisticated analysis and modeling remains to be done.

It is interesting that the "pure" measure of discrimination against females, DISIND (female enrollment as a proportion of male), is a bit more strongly related to female infant mortality than male. The R^2 for female infant mortality with DISIND is .514 (i.e., 51.4% of the variance is explained by this factor), whereas the R^2 for DISIND and male infant mortality is slightly lower, .474 (indicating 47.4% variance explained).

Similarly, in #6 in Table 9, which links the magnitude of females' longevity advantage with their educational access/disparity status, it is the DISIND index, the purest measure of female under representation vis-a-vis males, that explains more of the variance and produces the most significant F statistic. In the developed countries of the world, women tend to outlive men by about seven years. So countries where this figure is much lower may have higher maternal mortality rates and

[43] In the Mexican study by LeVine et al., discussed in section 4.4.4, not a single infant death was found among women with more than six years of education.

other ongoing mortality processes that hit females hardest. One example is selective child rearing/health practices that more aggressively treat illnesses in boy children. In only three of the 52 countries—Pakistan, Nepal, and India—do women have shorter life expectancies than men. In all three, women are quite heavily disadvantaged in relative access to education.

It is also noteworthy, for policy purposes, that the combined index, UTILDIS, is quite strongly and inversely linked to the total fertility rate (TFR, #2, $R^2 = .275$, $p < .0001$). Development may (ultimately) be "the best contraceptive," as the population literature often states. But recall that this data set included 29 tropical African countries—precisely those with the world's highest fertility rates and the weakest relationships between female education and fertility. So it merits further research to see whether there are any indications that fertility is, indeed, a bit lower in the African countries which have moved to increase educational access (GER) and reduce the discrepancy by gender (DISIND) in their systems of primary education. The strong inverse relationship Hess (forthcoming) found between fertility and development provides another reason, then, to invest in education for girls. Otherwise, every dollar invested in educating boys not matched by a dollar for educating girls might ultimately be lost to a nation by the subsequently higher fertility of those girls.

These results, preliminary though they are, tell us that the countries where little girls are least disadvantaged, with respect to primary education, are also countries that are: more developed (in terms of GNP/capita); have considerably lower infant mortality, lower fertility, women whose life expectancy vis-a-vis males is closer to the situation prevailing in developed countries, and a slightly more urban population than countries where girls are more discriminated against educationally. This tells us something about the way that a society values of the female half of the population—and also something about its economic and other prospects.

All in all, the data presented concerning the positive outcomes from educating women indicate that reducing the constraints against women and building up their human capital pays handsome returns to their nations, in both wealth and well-being.

CHAPTER FIVE

Conclusions and Selected Policy Implications

"What is good for women is also good for society at large," writes Sivard (1985, 7). Her statement also may be taken as this monograph's most general conclusion. A strong case has been established that women do, indeed, make major economic and social welfare contributions to both the micro level of family and the macro level of national development. These are important links that are usually ignored.

The road leading to this conclusion has been constructed from selected "building blocks" of empirical, quantitative and computer modelling studies showing how women contributed to the wealth and well-being of their close kin, communities and countries. One can raise methodological objections to a mode of argument relying heavily on deliberately chosen examples that support one's points. So it is, perhaps, of equal importance that the examples, or "building blocks," have been of great diversity in geographical origin, frequently augmented by the conclusions of others' literature reviews, and further strengthened by the cement of hypotheses from an emergent theory of gender and development (Blumberg, 1984, 1989b, forthcoming). Although there are still missing pieces, after an extensive review of the existing literature, no contradictory studies have been found. Caveats aside, it is hard to deny that the road reaches its intended destination.

5.1 Findings: Women and the Wealth and Well-Being of Nations

Before proceeding to some policy implications, let us review the major findings. This monograph has presented evidence of women's contributions to economic and social progress via two intertwined "chains" of effects—one is economic and the other is educational. Women's economic contributions have been given somewhat greater emphasis and space for both theoretical and empirical reasons. In comparison with education, women's productive/income-generating activities have been much less apparent to (and appreciated by) most development policymakers and practitioners. To date, four main factors have acted as filters, dimming the visibility of women's economic contributions to those who are nonspecialists in the field of Women in Development (WID, increasingly expanded to encompass gender and development):

- Women are frequently stereotyped as "housewives," involved primarily in "nonproductive" domestic and childcare tasks (Rogers 1980).

- These "housewifely" tasks almost never enter into national labor statistics, even when they are clearly parts of productive sequences (e.g., processing harvested crops to a form suitable for storage, transport and market sale; supplying fodder and water for animal husbandry).

- Even women's recognized productive activities, such as those involved in informal sector trade and the farming cycle (land preparation, cultivation, harvesting, local sale), are only inconsistently measured, as is attested by a growing volume of rigorous empirical studies on the undercounting of women's work.

- Most of women's economic pursuits and profits are completely invisible at the micro level of the household. This is because mainstream development planners view the household as a basic unit of analysis, a common enterprise described by a single production function. In their "black box" view of the household, the concept of "income under female control vs. income under male control" is not considered.

In contrast, this monograph has attempted to demonstrate the widespread existence of an "internal economy of the household" based on gender and age—conceptualized as a continuum ranging from households characterized by almost entirely "separate purses" among adult male and female members, to those where adult women have virtually no income-generating opportunities and indeed are part of a "single production function household." In much of the world, it has been suggested, the unitary household model fits poorly. Instead, the "internal economy of the household" model applies, and its gender division of information, resources, labor, and income often have far-reaching consequences for both micro and macro levels of economic development. In short, it *does* matter who does the work and who gets the rewards within the household. Indeed, not only the evidence on the internal economy of the household, but most of the material presented in Chapters 1-3 may be both new and counterintuitive for many development policymakers and practitioners. They are used to viewing women mainly as non-economic creatures submerged within a unitary household, while espousing a model of development that considers economic variables as paramount. This is why the monograph begins with and emphasizes women's economic contributions—especially activities that generate income under women's control.

5.1.1 WOMEN'S ECONOMIC CONTRIBUTIONS

One can "make the case for the gender variable" most persuasively if one can connect women's economic involvement with their country's economic progress. There are two promising new ways of doing this: (1) quantitative analysis of women's relative contributions to national growth, and (2) computer modeling. Both of these approaches focus on women's work, but go beyond labor force statistics to link women's work to national development in novel ways.

The first involves careful quantitative measurement of women's relative contributions to national economic development, a new focus of research that thus far has been confined to the United States. Here, only formal sector economic participation is considered, but even this represents a quantum leap forward. Women's growing formal labor force participation and rising wage ratio, from 1890-1980, added 28% to U.S. national income per capita beyond what it would have been, based on male earnings alone (Goldin 1986). And women's willingness to teach for low wages

over this same period made possible the mass education that added another 12-23% to national income (Carter 1986; Denison 1962).

Howe (1985) applies the second new way of looking at women's economic contributions to national development—computer modelling. In the Yemen Arab Republic, 45% of women work in agriculture as unpaid family labor, while half the male labor force is working for remittance money in the oil-rich Persian Gulf states. But women's productivity is constrained by the fact that the women of a household, Howe estimates, spend 11.5 hours per day on fetching water and firewood and cooking. Howe projects the economic consequences of reducing that daily household burden to 1.7 hours, merely by improving water availability and supplying cooking gas. He finds that several looming economic crises for the remittance-dependent, agriculturally declining country could be avoided by freeing time for increasing women's agricultural productivity and girls' school attendance.

Looking at the consequences of women's income represents an even greater departure in terms of the mainstream development paradigm—and one with important theoretical and policy implications. Significant evidence demonstrates that income under women's control:

- Is most often spent for children's nutrition and the family's "basic human needs;"
- Generally enhances women's decision-making power within the household, including their input into fertility decisions; and
- Is valued and sought by many women with provider responsibilities, who often attempt to (re)allocate their labor to get it.

Since women usually earn less and thereby have lower opportunity costs, females with responsibilities as providers may be more responsive than their male counterparts to reductions in production constraints and even modest increases in prices—when these involve activities whose income the women control. This proved to be the case in the Cameroon village that got the new road (Henn 1988).

Women's responsiveness to income-earning opportunities seems to explain what otherwise might be a puzzle in the development literature. A growing (although still fragmentary) body of evidence tracks what happens when women's burden of "domestic drudgework" activities (such as fetching water and firewood, hand processing, etc.) is decreased by a development program or project intervention.

On the one hand, the studies are fairly clear that where the women were able to turn the time saved, and/or the water, fuel, or processing equipment, into income-generating activities under their own control, they generally did so. In other words, women typically seized opportunities for own-account income-generation over leisure.

On the other hand, results are ambiguous or mixed as to whether women devoted the time saved to increased agricultural labor. It appears that these studies did not ascertain whether the women would receive any direct benefits from increasing their agricultural labor time. (Presumably, the researchers implicitly used the "black box" model of the household, whereby it would not matter.) Some of the results show women opting for leisure over increased time spent on agriculture. Could it be that these were instances where women could expect little in return (i.e., income or food under their control) from their added work? Recall that various other studies presented above (e.g., Jones on the Cameroon SEMRY I irrigated rice project, Broch-Due on the Kenyan irrigation scheme for the Turkana, as well as Henn on the Cameroon village that got a road) showed that African women who had a stronger stake in the rewards increased their labor in agricultural production—and decreased it when they had less to gain.[44]

Now that the first wave of women farmers is receiving agricultural extension in a few, largely African, countries, the question of "who benefits" should be kept in mind. There is ample evidence of development projects that suffered and/or failed because women were expected to labor but received no direct benefits. Analogously, although there are no data as yet, it seems likely that women extension clients would be far less willing to adopt new agronomic practices that may mean more work but provide no direct return. Conversely, they may be much more enthusiastic and effective "acceptors" when they can count on getting control of at least part of the resultant food or income.[45]

5.1.2 THE VALUE OF FEMALE EDUCATION

In contrast to these little known and "counterparadigm" economic findings, few development planners or practitioners would disagree with the principle that educating girls brings benefits to both the females and the larger society. Nevertheless, they may be unaware of the magnitude of the benefits or the many different types of positive consequences flowing from female education. Solid data presented here show that educating girls is associated with such felicitous outcomes as:

- A higher age of marriage (often a precursor to lower fertility);
- Lower fertility, in most countries;
- Greatly reduced infant and child mortality, which, in turn, is also associated with lower fertility;

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[44] Given that the "internal economy of the household" is viewed as a continuum, there might be places (perhaps the Yemen Arab Republic) where women would indeed increase their labor in household enterprises without the need for separate incentives. But this is an empirical question.

[45] Again, the possibility of regional and cultural variation remains an open question that must be explored empirically.

- Healthier, better nourished children; and
- Higher rates of participation in the formal, waged labor force, in most countries.

The links between female education and lower fertility are particularly noteworthy. Longitudinal empirical data now clearly show that reduced fertility enhances economic growth (Hess forthcoming). At the same time, education proves to have a multifaceted impact on fertility. First, education acts through increased age of marriage in many countries. Second, it is associated with higher rates of contraceptive usage. Third, there is a significant inverse link between female education and fertility in most nations. Fourth, female education is very strongly associated with lower infant mortality—and there is a strong negative association between infant mortality and fertility. Fifth, the enhanced value of time (opportunity costs) of educated women is generally associated with lower fertility. It should be stressed that female education is usually a stronger predictor for fertility and infant mortality than either male education or education presented without gender disaggregation.

In sum, the findings and conceptual framework presented in this monograph convincingly "make the case for the gender variable." They show that women make notable contributions to the wealth and well-being of their nations as well as their families. The evidence presented also lends support to the other two assertions with which this paper began:

- Gender is both an essential and a critical variable in the "development equation"; and
- The use and expansion of women's productive capacities is a necessary condition for social and economic progress.

5.2 Policy Implications: Gender and the "Development Equation"

What are the policy implications of these findings and conclusions? Four important ones are:

- Gender must be "tracked" through projects, programs, and policies and these should be adapted to overcome special constraints on women's participation, productivity, and access to/control over benefits. For projects, gender-disaggregated data should be collected at the baseline/project-preparation phase, and continued during monitoring and evaluation so that appropriate adaptations can be made when needed.
- Attention to African women farmers' needs, constraints, and incentives may be the single most cost-effective approach to alleviating the African food crisis.
- The "lessons learned" from the most successful microenterprise credit projects must be applied to future projects, policies and programs: empirically, these have reached female microentrepreneurs and found them to be equal or better credit risks than men.
- A dollar spent on boys' education not matched by a dollar spent on girls' education may be lost to a developing nation by the subsequently higher fertility of those girls—along with subsequently poorer health and lower infant/child survival rates and productivity.

5.2.1 GENDER-DISAGGREGATED TRACKING AND ADAPTATION OF DEVELOPMENT EFFORTS

Baseline statistics need to be collected and analyzed in a gender-disaggregated manner. This enables the identification and comparison of male and female inputs, constraints, and outputs relevant to various projects, programs, and policies. It is particularly important to gather gender-disaggregated data on the division of resources and returns to labor, not just the division of labor. Another critical dimension is a gender-disaggregated analysis of constraints to (1) participation in project activities and (2) receipt of project benefits.

If women are, or could be, involved in or affected by program/project activities, and their participation is found to be important to project success, then a gender-disaggregated analysis of their incentives and constraints can provide guidelines for designing and adapting projects to insure women's access to activities and benefits. If the gender-disaggregated analysis shows that women are not involved in the activities on which the project will focus, they need not be targeted but it will be useful for project monitoring and evaluation to determine whether they are being helped or harmed by project activities.

Data also must be disaggregated to distinguish possible benefits and constraints for various socioeconomic, ethnic, age and other categories of persons. These data, along with gender-disaggregated analyses, can be used in development planning and implementation to eliminate barriers that may prevent less visible and more vulnerable target groups from involvement and rewards.

When projects in which women have been determined to be important are implemented, continued gender-disaggregated monitoring is needed to see how effectively and efficiently the project is serving different subgroups of males and females. For example, in a microenterprise project, relative efficacy could be measured by keeping track of male and female arrearage and parameters of business and employment growth for enterprises of different sizes.

As a last step, final evaluations must collect gender-disaggregated data on the impact on women, as well as on men. The operative questions here are: how did various subgroups of males and females help or hinder the project and how, in turn, were they helped or hurt by the project?

In sum, the widespread use of gender-disaggregated tracking and project adaptation can serve as a sign that gender is being taken seriously as an important variable for the "development equation." And the results of such actions, as revealed by gender-disaggregated project evaluations, then can be used to build up a body of "lessons learned" about what does and does not work to integrate women into the activities and benefits of economic development. In all likelihood, we will concomitantly learn additional lessons about now-unsuspected contributions which women make to their country's development.

5.2.2 "WOMEN MAY BE THE SINGLE MOST COST-EFFECTIVE AVAILABLE RESOURCE TO ALLEVIATE THE AFRICAN FOOD CRISIS"

This statement (Grosz 1988) actually was prefaced by several caveats: if women food crop farmers were given appropriate information, technical assistance, credit and incentives, then the conclusion follows. Women may be the single most cost-effective resource because:

- Women raise as much as 80% of the food crops in sub-Saharan Africa (Sivard 1985, 5,17);
- Most agricultural extension information and assistance, credit, and subsidized inputs still are targeted to males. But in a few African countries, where women are now beginning to receive extension aid, they often have shown a preference for receiving extension in women's groups, which is more cost effective;
- Men and women tend to have separate own-account activities associated with agriculture (e.g., trading, or certain "men's" vs. "women's;" crops);
- Men and women tend to maintain at least partially "separate purses" and have separate expenditure responsibilities, with many women having duties as providers for their children and mutual obligations with natal kin;
- Given the two preceding points, it is not surprising that studies of development projects have found that women (1) try to allocate their labor toward activities which provide food and/or income under their control, and (2) are very responsive to incentives involving crops whose income they control—which, as noted, are mainly *food* crops; and
- Due to the combination of women's (1) need for money, given their provider responsibilities and the "separate purse" system, (2) their generally lower income and thereby, (3) lower opportunity costs, they may be even more responsive than men to modest price increases in crops whose income they control.

These statements are not meant to imply that the neglect of women farmers is the only cause of the African food crisis, or that giving them assistance and incentives will result in a magical and immediate "cure." However, Africa does seem particularly ill-served by the stereotypes and stock assumptions of many mainstream development planners. Clearly ill-suited for Africa are the notions that the farmer is a "he," and that the household is a unified entity of pooled resources under the presumably altruistic leadership of its male head. So long as food crop production in Africa is overwhelmingly in the hands of small farmers, and so many of them are women, basic economics would seem to dictate that development policymakers and project officials take into account the characteristics and needs of the actual food producers.

That, by and large, they still do not—despite the best efforts of more than a decade of Women in Development (WID) researchers and practitioners—remains a vexing mystery and a lost opportunity of major proportions. Most of the other factors involved in the African food crisis (such as ecological degradation, the need for massive infrastructure investment, the lack of a Green Revolution breakthrough on the region's major food crops, the need for a truly effective extension

"package," war, etc.), are expensive and difficult to attack. In contrast, attention to the constraints and incentives of women farmers must be considered one of the factors most easily and inexpensively accessible to policy remediation.

The policy implication emerging from this discussion is strong and clear.

5.2.3 THE "LESSONS LEARNED" FROM THE MOST SUCCESSFUL MICROENTERPRISE CREDIT PROJECTS MUST BE HEEDED, AND WOMEN RECOGNIZED AS EQUAL OR BETTER CREDIT RISKS

Microenterprise credit projects are an increasingly popular form of intervention. They very often have been found to create employment, as well as a highly positive economic "multiplier effect" among informal sector people who never before had been seen as appropriate recipients of credit. Evaluations of the most successful have found some common denominators, or "lessons learned":

- They eliminated the constraints of hidden "up front costs" and other barriers to poor microentrepreneurs (e.g., excessive bureaucratic paperwork and delays, repeated visits to distant institutions whose personnel lacked understanding of the enterprises or needs of the poor).
- Often as a result of eliminating such "up front" constraints, they have attracted unexpectedly large numbers of women borrowers—a consequence that sometimes was totally unanticipated initially.
- Empirically, women borrowers have been found to be equal or better credit risks.
- There are preliminary indications that women's enterprises may create more employment, and/or grow faster, on standard business parameters, than those of their male counterparts (e.g., Blumberg 1985, 1989c).

Gender-disaggregated tracking and adaptation of programs and projects will provide a stronger empirical base for these microenterprise "lessons," but already results to date are clear-cut enough to justify strong efforts to identify and serve women in future microenterprise projects.

5.2.4 "A DOLLAR SPENT ON BOYS' EDUCATION MUST BE MATCHED BY A DOLLAR SPENT ON GIRLS' EDUCATION OR SOON BE LOST TO THE COUNTRY BY FEMALES' HIGHER FERTILITY"

This is clearly an overstatement, given the present state of the empirical evidence. Thus far, there are no studies that match the costs of female education with the price a nation pays for excessive fertility. But as a provocative catch phrase, the statement is intended to drive home one of the major impacts of female education—its multifaceted effects on fertility as well as on the survival rates and health of children born to women who have had at least primary school education.

How much education is required for its consequences to manifest themselves? In some countries, only primary education is needed for dramatic payoffs in reduction of fertility and other related variables such as age of marriage and infant/child survival. This was certainly the case in the 52 country sample included in the simple regressions (in section 4.8), where female enrollment rates and male/female disparity ratios in primary school strongly affected many of these variables.

In other countries, some impacts of education may not "kick in" until fairly high post-primary levels. For example, its impact on raising the age of marriage may be stronger for secondary than primary education, when staying in school causes a girl to exceed the traditional age of marriage. We saw this in Schildkrout's study in Northern Nigeria (1982, 1984) and Martin's (1987) article on Bangladesh—where secondary education also was associated with dramatically higher rates of contraceptive use. In LeVine's Mexico study, infant deaths proved to be zero among women with 7-9 years of education (his maximum). And the World Fertility Survey found that, in some African countries, fertility is not negatively affected until women have 10+ years of education.

This leads to a policy dilemma, especially for those African and South Asian/Islamic countries which still have large disparities in the proportion of girls and boys in primary school and very high fertility rates. Should scarce educational dollars be spent on increasing the percentage of girls getting elementary education or on giving girls already in school enough secondary education to assure a sizeable fertility payoff? For many Latin American/Caribbean and some East Asian countries the question is moot. They already have high literacy rates and rough parity in male/female enrollments at both primary and secondary levels of education.

But for other developing countries, the evidence is sufficiently strong to indicate that enhancing female education at both primary and secondary levels should have very positive societal effects. In these countries, creating a "zero sum game" where girls' education is expanded at the expense of boys' would presumably meet with considerable resistance. Accordingly, the main policy implication must be that investing in female education should be given a higher priority by the bilateral and multilateral donor agencies than has been the case.

In summary, we have only skimmed the surface of the policy implications that can be drawn from the incontestable facts of women's contributions to the wealth and well-being of their nations. But despite the gaps in our knowledge, this discussion has demonstrated that we already know enough to agree with former Tanzanian President Julius Nyerere that:

> A person does not walk very far or very fast on one leg; how can we expect half the people to be able to develop a nation? (quoted in Howald and Wycoff-Baird 1988, 3).

We also know enough to set about transforming development policy and practice into a "two-legged" affair. Although progress would be fastest if promoted from the top, from the policymakers whose agendas and strongest priorities translate into action, people at all levels of the

development community can initiate change. Just by a simple analysis of how much more could be accomplished with both halves of the population and adapting programs and projects to follow suit, we can make our own contribution—not just to women, but to the wealth and well-being of the world of nations.

APPENDIX

Tables From the World Fertility Survey

TABLE 112. MEASURES OF CURRENT AND CUMULATIVE FERTILITY ACCORDING TO RESPONDENT'S EDUCATION:[a] TOTAL FERTILITY RATE FOR AGES 15-49; TOTAL MARITAL FERTILITY RATE FOR DURATIONS 0-24; AND MEAN NUMBER OF CHILDREN EVER BORN TO WOMEN AGED 40-49

	Total fertility rate, by years of education					*Total marital fertility rate, by years of education*					*Children ever born, by years of education*				
	Zero (1)	One to three (2)	Four to six (3)	Seven or more (4)	Difference: (1) – (4) (5)	Zero (6)	One to three (7)	Four to six (8)	Seven or more (9)	Difference: (6) – (9) (10)	Zero (11)	One to three (12)	Four to six (13)	Seven or more (14)	Difference: (11) – (14) (15)
A. *Country*															
Africa															
Benin	7.4	8.5	5.8	4.3	3.1	6.8	7.2	5.9	5.3	1.5	6.2	..	(5.0)	(4.8)	1.4
Cameroon	6.4	7.0	6.8	5.2	1.2	5.5	6.2	6.3	5.2	0.3	5.2	5.1	4.9	(3.6)	1.6
Côte d'Ivoire[b]	7.4	8.0	6.4	5.8	1.6	6.6	7.1	5.7	6.8	−0.2	6.9	---------(6.8)---------			..
Egypt[c]	..	..	..	..	..	6.5	6.4	6.2	3.8	2.7	6.8	7.2	6.5	3.7	3.1
Ghana	6.8	6.7	6.7	5.5	1.3	6.2	5.7	6.0	5.3	0.9	6.4	6.4	7.0	5.5	0.9
Kenya	8.3	9.2	8.4	7.3	1.0	7.5	8.3	8.1	7.7	−0.2	7.6	8.4	7.8	7.8	−0.2
Lesotho	6.2	5.6	6.0	4.8	1.4	5.4	5.5	5.9	5.9	−0.5	4.9	5.0	5.2	5.2	−0.3
Mauritania[d]	..	..	..	..	..	6.9	---------6.0---------			..	5.9	6.0	..	..	..
Morocco	6.4	5.2	4.4	4.2	2.2	7.0	5.5	5.8	4.6	2.4	7.1	(7.3)	(6.3)	..	..
Senegal	7.3	(9.4)	6.3	4.5	2.8	7.0	(7.3)	6.8	(6.1)	0.9	6.9	---------(6.9)---------			..
Sudan	6.5	5.6	5.0	3.4	3.1	6.7	7.4	6.9	5.1	1.6	6.1	(6.9)	(5.8)	(3.9)	2.2
Tunisia[e]	..	..	..	..	..	7.3	5.9	6.0	3.9	3.4	6.8	(5.9)	6.4	(3.6)	3.2
Latin America and the Caribbean															
Colombia	7.0	6.0	3.8	2.6	4.4	6.8	6.3	4.3	3.2	3.6	7.0	6.8	5.9	4.5	2.5
Costa Rica[e]	5.0	5.0	3.6	2.7	2.3	5.1	4.9	3.8	3.2	1.9	8.7	7.2	6.0	3.6	5.1
Dominican Republic	7.0	7.3	5.4	3.0	4.0	6.9	7.2	5.9	3.8	3.1	7.2	6.9	5.8	4.3	2.9
Ecuador	7.8	7.2	5.3	2.7	5.1	7.4	7.4	5.8	3.3	4.1	7.9	7.4	6.2	3.8	4.1
Guyana	6.6	7.0	5.6	4.8	1.8	(6.7)	(7.6)	5.8	5.1	1.6	7.5	6.5	6.9	5.8	1.7
Haiti	6.0	4.8	4.1	2.8	3.2	5.9	4.9	5.0	3.9	2.0	5.8	6.0	5.6	(3.5)	2.3
Jamaica	(6.2)	(5.9)	5.8	4.8	1.4	(5.6)	(4.8)	5.1	4.7	0.9	(4.4)	5.5	6.1	5.3	−0.9
Mexico	8.1	7.5	5.8	3.3	4.8	7.9	7.7	6.3	4.1	3.8	7.4	7.1	6.4	3.8	3.6
Panama[e]	7.0	6.9	5.0	3.0	4.0	6.7	6.7	5.2	3.4	3.3	7.1	7.0	5.9	4.0	3.1
Paraguay	8.2	6.6	4.6	2.9	5.3	7.7	6.6	5.0	3.3	4.4	7.4	7.2	5.4	3.1	4.3
Peru	7.3	6.8	5.1	3.3	4.0	7.6	7.1	5.6	4.2	3.4	7.4	6.6	5.8	3.9	3.5
Trinidad and Tobago	(4.6)	(3.4)	4.1	3.2	1.4	(6.1)	(2.2)	4.4	3.4	2.7	7.1	6.9	6.1	5.0	2.1
Venezuela[f]	7.0	6.4	4.6	2.6	4.4	7.4	6.6	5.1	3.6	3.8	7.9	6.9	5.3	4.0	3.9
Asia and Oceania															
Bangladesh	6.1	6.4	6.7	5.0	1.1	6.1	6.3	6.9	5.9	0.2	6.9	7.0	7.6	(6.9)	0.0
Fiji[e]	..	..	..	..	..	5.0	5.1	5.2	4.6	0.4	6.9	7.1	6.1	5.6	1.3
Indonesia[e]	..	..	..	..	..	5.0	5.5	5.5	5.0	0.0	5.2	6.1	5.6	4.5	0.7
Jordan	9.3	8.6	7.0	4.9	4.4	9.7	9.3	7.7	6.2	3.5	8.9	9.0	7.2	6.2	2.7
Malaysia	5.3	5.3	4.8	3.2	2.1	6.2	6.0	5.8	4.0	2.2	6.3	6.2	5.9	3.7	2.6
Nepal[e]	..	..	..	..	..	6.0	(6.8)	(6.4)	(4.0)	2.0	5.7	---------(3.9)---------			..
Pakistan	6.5	5.4	6.1	3.1	3.4	7.0	6.2	7.0	5.1	1.9	6.9	(5.8)	6.5	(5.1)	1.8
Philippines	5.4	7.0	6.2	3.8	1.6	6.7	7.4	6.9	5.0	1.7	7.0	7.4	6.9	5.2	1.8
Republic of Korea	5.7	5.5	4.3	3.4	2.3	6.2	5.6	5.0	3.8	2.4	6.0	5.7	5.2	4.0	2.0
Sri Lanka[e]	..	..	..	..	..	5.6	5.3	5.3	4.3	1.3	6.4	6.0	5.8	4.4	2.0
Syrian Arab Republic	8.8	8.7	5.6	4.1	4.7	9.0	7.2	6.5	5.4	3.6	7.8	6.3	6.6	4.0	3.8
Thailand[e]	..	..	..	..	..	5.5	5.7	5.4	3.2	2.3	6.1	6.6	6.5	4.0	2.4
Yemen[g]	8.6	---------(5.4)---------			..	7.8	---------8.5---------			..	6.8	..	..	..	..
B. *Region*[h]															
Africa	7.0	7.2	6.2	5.0	2.0	6.6	6.6	6.3	5.4	1.2	6.4	6.5	6.1	4.8	1.6
Latin America and the Caribbean	6.8	6.2	4.8	3.2	3.6	6.8	6.2	5.2	3.8	3.0	7.1	6.8	6.0	4.2	2.9
Asia and Oceania	7.0	6.4	5.8	3.9	3.1	6.6	6.4	6.1	4.7	1.9	6.7	6.7	6.4	4.9	1.8
C. *Level of development*[h]															
I. High	6.2	5.9	4.8	3.4	2.8	6.3	5.8	5.1	3.9	2.4	6.9	6.6	6.0	4.5	2.4
II. Middle-high	7.7	7.2	5.6	3.5	4.2	7.3	6.9	6.0	4.3	3.0	7.3	6.9	6.3	4.2	3.1
III. Middle-low	6.9	7.0	6.4	5.5	1.4	6.2	6.3	6.2	5.5	0.7	6.2	6.5	6.2	5.0	1.2
IV. Low	6.9	6.7	5.7	3.8	3.1	6.7	6.6	6.4	5.1	1.6	6.4	6.3	6.1	4.8	1.6
D. *Strength of family planning programme effort*[h]															
1. Strong }	5.9	5.8	4.8	3.3	2.6	5.9	5.8	5.2	4.1	1.8	6.5	6.6	6.0	4.5	2.0
2. Moderate }						6.3	5.4	5.5	3.7	2.6	6.8	6.6	6.2	4.2	2.6
3. Weak	7.0	6.6	5.7	4.0	3.0	6.9	6.7	6.2	4.7	2.2	7.1	6.9	6.5	5.1	2.0
4. Very weak/none	7.5	7.2	5.9	4.4	3.1	7.1	6.9	6.2	5.3	1.8	6.7	6.5	5.9	4.5	2.2
Total for countries with TFR available[h] (30 countries)	6.9	6.6	5.5	3.9	3.0	6.8	6.5	5.9	4.7	2.1	6.9	6.7	6.1	4.6	2.3
Total, 38 countries[h]	..	..	..	..	..	6.7	6.4	5.8	4.6	2.1	6.8	6.6	6.1	4.6	2.2

Sources: Ashurst, Balkaran and Casterline (1984); and special tabulations.

NOTE: Values enclosed in parentheses are those based on small numbers of observations: for the total fertility rate and total marital fertility rate, fertility measure based on fewer than 500 women-years of exposure or fewer than 20 women-years of exposure for any five-year age group under age 30 or marital duration group under 15 years; for children ever born, 10-24 cases. For children ever born, educational categories containing fewer than 10 observations are not shown or (if this would mean suppressing more than two categories) are combined with adjacent categories.

[a] Years of schooling completed.

[b] Formerly called the Ivory Coast.

[c] Children ever born based on ever married women aged 40-49, rather than on all women of these ages.

[d] Educational categories are: none; less than primary or Koranic school; primary completed; more than primary.

[e] Fertility rate at ages 15-19, used for computing the total fertility rate, is taken from the period 5-9 years before the survey.

[f] Total fertility rate refers to ages 15-44; children ever born based on ages 40-44.

[g] In Yemen, all interviewed women aged 40-49 had zero education.

[h] Averages excluding values for combined or missing categories.

Source: UN 1987, p. 224

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