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INCREASING FOOD PRODUCTION IN THE THIRD WORLD: A REVIEW OF RESEARCH METHODS AND THEIR RELEVANCE TO FEMALE FARMERS

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ABSTRACT

INCREASING FOOD PRODUCTION
IN THE THIRD WORLD: A REVIEW OF
RESEARCH METHODS AND THEIR RELEVANCE TO
FEMALE FARMERS

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The subsistence sector, comprised of small-scale, family farms with limited, though increasing, involvement in market production, is not well understood by policy-makers and researchers. Furthermore, this sector is often neglected in agricultural development efforts. Yet, subsistence farms account for a significant share of the food supplies in Third World countries and employ a large portion of the total population. Of the people engaged in food crop production, a significant number of them are women, many of whom are semiautonomous farmers. Given these facts, it seems that government objectives to improve food security can not be fulfilled without increased understanding and further integration of both subsistence farming and female farmers.

The objectives of this study were the following: 1) to substantiate women's significant contribution to food crop production, and clarify the sexual division of labor associated with food crop cultivation; 2) to determine whether or not existing assumptions of the farm and home production are adequate for the study of subsistence agricultural production in the Third World; and 3) to identify some weaknesses of standard practices based on these assumptions that

contribute to program failure or low achievements and to recommend improvements in these practices

The results of the study confirm that the contribution of women to agricultural production in the Third World is considerable. Women provide a large portion of the labor used in field, livestock and processing activities, they manage farms, control decision-making concerning a number of agricultural activities and often contribute over half of the total family income (cash and home production). Specific variables were identified that influence the extent of women's contribution.

Definitions of production and the standard corporate family farm model were analyzed to determine their appropriateness for the subsistence system. Suggestions to extend and improve the model were made. Also provided are recommendations for data collection procedures so that more subsistence activities are included.

It was argued that some factors which limit the effectiveness of agricultural development programs can be attributed to unrealistic models of the family farm. Extension programs of Sub-Saharan Africa were reviewed with respect to their ability to reach female farmers and producers with useful information corresponding to their participation. Inconsistencies between the actual production system and the design of other programs of the region were indentified. Suggestions were provided for improving the design and implementation of agricultural development programs.

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER ONE

INTRODUCTION

A current major concern within the field of development is food security whether that be in terms of "self-reliance" (assuring availability of food) or "self-sufficiency" (self-provisioning of food). At the present time, the food security issue appears to be divided into studies that focus on specific aspects of the problem suggesting specific solutions: international or domestic buffer stocks, compensatory financing, food aid, export promotion to earn foreign exchange for food import needs, income generation to raise "effective demand" (the ability to pay) for food, and finally, promotion of domestic food-crop production. While these mechanisms can collectively contribute significantly to the resolution of the food problem, no single mechanism should be expected to be independently sufficient. The resource base of a particular less developed country (LDC) and the additional or alternative government objectives determine the choice of mechanisms to employ which in turn influence the degree of success in fulfilling food security objectives.

1.1 Need for the Study

The subsistence sector, composed of small-scale/family farms with limited, though increasing, involvement in market production is not well understood by either policy-makers or researchers. It has, to a great extent, been overlooked or ignored until recently. In part, because women are involved predominately in the subsistence sector and

in many areas they dominate this sector, they have been largely ignored. Their role has been misunderstood and their contribution has been greatly underestimated.

Although neo-classical analysis has been able to explain some aspects of the subsistence sector, e.g. many market activities, the analysis has either missed or misconstrued the extent and significance of women's contribution to agricultural production as well as the importance of many non-market activities and the interdependencies of the entire production system. This may be attributed to the bias of researchers or the bias and/or limitations of standard economic tools and methods. It appears as though a broader, more precise framework needs to be developed. A presupposition of this study is that a better understanding of the subsistence production system and, specifically, women's role within this system, will help clarify appropriate and consistent policy prescriptions, and therefore, chart a more effective path toward achieving food security.

1.2 Objectives

This thesis will attempt to provide the basic groundwork to develop a framework for analyzing subsistence food-crop production, although the scope of the thesis will be considerably more narrow than the overall subsistence system. First, the study will focus on women and their contribution to food-crop production largely because it is often a woman's responsibility to provide food for her family whether or not a male is present, and because only minimal attention has been given to women in standard economic analyses thusfar. Second, with respect to the above mentioned aspects of the food security issue, this thesis will deal with the promotion of domestic food-crop production and to a

limited extent income generation. As a result of this concentration, the emphasis will be on self-sufficiency. Moreover, the focus will be on local (micro-level) self-sufficiency. Finally, the study will be narrowed by focusing the analysis on Sub-Saharan Africa because it is here that food shortage problems are the most acute and severe, and the situation of this region is expected to deteriorate rapidly. More specific objectives are as follows:

1) Substantiate women's significant contribution to food crop production, and clarify the sexual division of labor associated with cultivating food crops.

2) Determine whether or not pre-existing theory and models of the farm and home production are adequate for the study of semi-subsistence agricultural production in the Third World.

3) Identify some weaknesses of standard practices associated with the conceptualization of semi-subsistence agricultural systems that contribute to program failure or low achievements, and recommend improvements.

1.3 Methods

To fulfill these objectives, the following procedures will be undertaken. Each item in the procedures corresponds to and provides a brief summary of the contents of a separate chapter, begining with Chapter 2. Although not mentioned here, a concluding chapter is also included. The procedures are as follows:

1) Provide an overview of women's contribution to small-scale, semi-subsistence agricultural production. This will include:

   a) production defined as the creation of time, form and space utility,
   b) generalizations which may extend over most of the Third World,
   c) variables which influence the type and extent of women's contribution, e.g. caste, religion or migration.

2) Provide a discussion of two important conceptual issues: what is production and what is the appropriate unit of study. More specifically:

   a) exploring definitions of production and the variety of measures identified and/or utilized by various information gathering agencies,
   b) dispelling the single or single male head of household misconception; and exploring new definitions of the household and household head as a unit of study, e.g. concept of the decision-maker or de facto head.

3) Trace the ramifications of an inappropriate or inaccurate conceptualization in terms of projects and programs. This will include:

   a) discussion of survey and data collection techniques
   b) inconsistencies in extension programs,
   c) case studies of project failure or low project achievements.

The bulk of the resources to be used for this study are listed in the bibliography. Because most of the data reporting on women's activities are unreliable, this study has avoided sophisticated statistical techniques and instead has relied on case studies. The analysis is extracted from the pre-existing body of research on subsistence food crop production as well as on women and international agriculture. Although the study centers on neo-classical economic analysis, it will also borrow freely from studies in the fields of sociology and anthropology where necessary and where such contribution enhance the analysis.

CHAPTER 2

WOMEN'S CONTRIBUTION TO AGRICULTURE

2.1 An Overview of Women's Contribution to Agriculture

2.1.1 Introduction

This section of the paper attempts to provide a general description of women's contribution to agricultural production (that is, creation of time, space and form utility) and related community and household activities. In addition, factors which may cause either real (as opposed to apparent) deviations from these generalizations are identified. The intention is to establish a reference for research that incorporates at least a basic understanding of the allocation of agriculture labor inputs which are both heterogenous and lack (or are limited in) the transitivity of resource use. Other sections of this paper deal more extensively with research methodologies as well as past, present and future project formulation and policy choices.

Women's contribution to the world's food supply is impressive. Worldwide, "...women contribute 44 percent to the food supply in a total of 1170 societies" (Butler, 1979:8). According to the United Nations Economic Commission on Africa (ECA) and the Economic and Social Commission for Asia and the Pacific (ESCAP), women provide 60 to 80% of the agricultural labor in Africa and Asia. The Economic Commission for Latin America (ECLA) estimates a figure of 40% for Latin America as a whole (Lewis, 1981:32).

The data in Table 1 indicate the variability of women's work

effort among countries and among regions within a country. It should be

Table 1

Women's Contribution to Agriculture: Selected Areas

Country/Region	Measure	Year	Source*
Africa			
Botswana	48-80% of crop activities	1974	179.7/168.13
Burkina Faso			
Resettlements	15 hrs/day growing season	1977	177.157
	74% of all crop work	1974	179.7
Cameroon (East)	55% of ave. "man"-days/ha	1980	15.45
Gabon	200 days/year in ag. prod. approx. 0 for men	1978	7.14
Ghana	54% of ag. employees and self-employed	1978	218.10
Kenya	80% of subsistence ag. work	1973	179.8
	provide 95% of village food supply	1981	212.56
Kakamega	40% of farm managers	1975	197.2
Mwea Rice			
Resettlement	11 hrs/day and 6 days/wk	1973	177.157
Lesotho	up 10hrs/day ag. work	1974	219.11
	85% of Ag. labor-force	1979	23.35
Mozambique	34% of ag. employed and selfemployed	1978	218.10
	33.9% of econ. active in ag., hunting, forestry	1973	131.115
Tanzania	51% of those in ag.	1977	179.7
	3,067 hrs/yr in ag. Men only 1,629.	1969	204.140
West lake			
region	2,600 hrs/yr in ag. Men only 1,800.	1978	7.14
Swaziland	70% of ag. work in food crops	1973	219.110
Zambia	>50% of the labor/hector	1980	23.44
Asia			
Bangladesh	10-14 hrs/day in income generating activities. Men only 1011 hrs/day	1975	177.157
	13-17.6 hrs/day	1975	165.40
India	20% ag. labor force	1980	74.375
Haryana	15-16.5 hrs/day	1975	177.157
	50% of crop prod. in wheat growing area	1975	177.162
Indonesia	39.9% of ag. labor	1980	74.375
Java	11.1 hrs/day. Men only 8.7 hrs/day	1976	177.157
Malaysia			
(Pennsular)	36.9% of ag. labor	1980	74.375

Nepal	30% of ag. labor	1980	74.375
	10.81 hrs/day. Men only		
	7.51 hrs/day	1978	7.14
Pakistan	14 hrs/day	1976	165.41
	26% of family ag. workers	1972	74.375
	5.5% of ag. labor force	1977	74.376
Latin America			
Antigua	50% of ag. labor force	1981	179.11
Bahamas	30% of ag. labor force	1981	179.11
Barbados	40% of ag. labor force	1981	179.11
Bolivia	60% of ag. labor force	1981	179.11
Brazil			
Northeast	>50% rate of ag. participation	1978	145.62
Ecuador	>50-60% rate of ag. participation	1978	145.62
Haiti	50% of ag. labor force	1981	179.11
Jamacia	26% of ag., fishing and forestry	1983	53.9
Mexico	>50-60% rate of ag. participation	1978	145.62
Monserrat	50% of ag. labor force	1981	179.11
Peru	50-60% rate of ag. participation	1981	145.62

* the number to the left of the decimal refers to the bibliographic source number, and the number to the right of the decimal refers to the page number of the source.
Note: These figures are exclusive of girls' work. The age cutoff is commonly 15 or 19.

noted, however, that measurements in general are subject to extreme, but often legitimate, criticism (see section on measurement). For the most part, these data were extracted from independent case studies from various disciplines rather than aggregate national censuses or country-study data. Consequently, the definitions (e.g., that which is included as agricultural or "productive" work) and units are inconsistent and not directly comparable. (This may reflect a major weakness in the research on women in international development or feminist studies in general). In some cases, e.g., Pakistan, the information is contradictory. Also worth noting, is that the participation of women is quite high in comparison with the world figure for men of 46-62% (UNDP, 1980:18).

Although, by definition, this figure for men can not be directly compared to those for women in Table 1, the figure is presented here to draw attention to the fact that the male labor force is far from fully employed.

The sexual division of labor in agricultural production and related activities does not follow a universal governing principal which delegates the distribution of reponsibilities between the sexes, but rather, it is a culturally determined and sometimes, but not always, rational set of social laws or norms created to facilitate efficient allocation of human resources within a given political and economic environment. Nevertheless, due to regional, cultural and historic similarities and interactions among groups of people, generalized patterns in the division of labor emerge. This is true for Third World rural economies although there are certainly exceptions.

2.1.2 Public Goods (utilities)

Included in public goods are: water, fuel, health (growing and administering herbs to livestock as well as people), informal education, sanitation, and transportation (products and inputs). In most societies with little or no social overhead capital or developed infrastructure, women provide nearly all of the public goods (utilities). Providing these goods is often extremely burdensome and time-consuming. Typically, cultivated plots are situated miles away from either the village or the local market, e.g. a Colombian woman may have to walk for five hours to transport her goods to a market (Ahmed, 1978:11). Marginal and more distant plots are generally allotted to subsistence-crops while preferred land is reserved for cash-crops. In Zaire, supplying water may entail carrying loads of 10-15 liters (from 22 to 33 lbs) of water over

a 45 minute trip several times a day (Ahmed, 1978:11).

Firewood gathering is also time-intensive, requiring approximately 6 hours per day in some rural Indian villages (Schick, 1978:11). Of course the gathering time required depends in part on the heat efficiency of wood, the population density and consequent demand for scarce wood and the agro-ecological factors which contribute to replenishing supplies. In many parts of Africa where there is a scarcity of wood, two hours on the average may be required for daily fuel collection (UNFAO, 1979a:117). As the data in Table 2 indicate, rural African women provide nearly all of the labor required for community production. In South Asia water and fuel is supplied only by women (see Table 3).

2.1.3 Field and Livestock Activities

The data in Tables 2 and 3 also illustrate the breadth of field activities undertaken by women in Africa and South Asia. In rural Africa, women typically supply 50% or more of the total labor required for planting, hoeing and weeding, harvesting and animal husbandry. The only only activities for which women's contribution is usually restricted are: clearing the land, hunting and tree crop trimming. It has been estimated that, on average, African women work 42% more hours in the field than do their menfolk (Rogers, 1980:159). A similar pattern is found in South Asia (Table 3). Men supply labor for plowing and heavy irrigation, whereas only women weed, transplant, care for the milch animals and poultry and maintain vegetable gardens.

In Latin America, a significant share of minifundio (subsistence) crop cultivation, vegetable gardening and most of the small animal husbandry are all commonly the responsibility of women, e.g. Belize

Table 2

Women's Participation in Rural Africa

Production	% of total labor
Land clearing	5
Turning the soil	30
Planting	50
Hoeing and weeding	70
Harvesting	60
Trimming tree crops	10
Animal Husbandry	50
Hunting	10
Processing and Distribution	
Transport crops: farm to home	80
Brewing	90
Food processing	100
Domestic food storage	50
Storing crops	80
Marketing excess crops	60
Community	
Water supply	90
Fuel supply	80
Community self-help projects	70
Household	
House-building	30
House repair	50
Cleaning, washing, etc.	100
Cooking for husband, children and elders	100
Bearing, rearing and initial education of children	100

Source: Data from UN Commission on Africa cited in Lewis, Barbara, ed. (1981). Invisible Farmers: Women and the Crisis in Agriculture. Washington, D.C., USAID, WID.

(Stavrakis and Marshall, 1973:10). The produce from these vegetable gardens add a variety of vitamins, minerals, fats and flavors to the diet as well as provide essential supplemental amino acids for protein

synthesis.

Table 3

Generalized Pattern of Women's Work in South Asia*

Activity	women only	both	men only
Production			
Plowing			x
Heavy irrigation			x
Sowing	x	x	x
Weeding	x		
Transplanting	x		
Harvesting		x	
Milch animals & poultry	x		
Vegtable gardens	x		
Processing and Distribution			
Processing (drying, husking, threshing, winnowing, cleaning, perserving)	x		
Stroage	x		
** Marketing	x	x	x
Community			
Water supply	x		
Fuel and fodder supply	x		
Household			
House building			x
House repair	x	x	
Cleaning, washing, etc.	x		
Cooking for husband, children and elders	x		
Bearing, rearing and initial education of children	x		

* Activities may possess more than one entry where several major patterns of a sexual division of labor coexists
** women market goods only where purdah is not observed.
Information taken from Dixon, Ruth. (1982). "Mobilizing Women for Rural Employment in South Asia: Issues of Class, Caste, and Patronge." Economic Development and Cultural Change. 30(4):377.

In her study of the Sahel region, Kathleen Cloud found that sedentary farmers of the Sahel follow a similar sexual division of labor (Cloud, 1977:1). Even in the case of millet and sorhgum

production, which is widely considered a man's crop, especially if it is commercially grown, women contribute a significant portion of the labor input, performing important tasks such as the selection and storage of seed. women's responsiblities also include providing the vegetable or milk sauce to accompany the grain, gathering wild plants and fruits and processing milk products that provide significant contributions to the food supply during specific (e.g. rainy) seasons and also some marketable surplus. Some species of wild plants, such as Baobob leaves of the Sahel, may possess a high market value (Cloud, 1977:7).

Among pastoralists, e.g. those of Somalia, women graze cattle, sheep and goats while the men herd the camels. Similarly, the Boran women of Kenya are responsible for small calves, sheep and goats (UNFAO, 1979a:15). In the Sahel, women's role in livestock maintanence is crucial. Women remove disease transmitting ticks and identify and treat neonatal calf enteritis (Sollod, et al, 1984:300).

> Interviews with the women also indicated that they did know how to diagnose many diseases. When syntoms of important diseases were discribed, they almost always knew the name of the disease (Sollod, et al, 1984:297).

Their close and consistent contact, particularly with lactating cows, establishes women as monitors of the daily appearance and disposition of livestock. Furthermore, they regulated how much milk young calves will consume and how much will be wxtracted for human consumption (Horowitz, 1981:85 and Smale, 1980).

In general, where there is a strict sexual division of labor, men supply labor for plowing, heavy irrigation, and large herd animals (camels and less frequently cattle). By contrast, women transplant, weed, care for milch animals and poultry, maintain vegetable and medicinal herb gardens, and gather wild plants and fruits.

2.1.4 Processing

The processing of products is also dominated by women in the Third World (see tables 2 and 3). Where processing agricultural products is performed by small decentralized units (households, compounds, etc.), women's labor comprise nearly all of the value added, although frequently the transformed product is not exchanged in the market. Where processing is centralized and/or utilizes a larger share of capital inputs (private firms, government marketing boards, etc.), there is frequently substitution of machinery and hired labor (often males) for women.

Processing grain by hand is extremely time-intensive. Of a group of studies carried out in Africa to measure the time required to manually process grains, one study determined that "... it took 13 hours just to pound enough maize to feed a family for between four and five days" (Rogers, 1980:155). In Mexico, hand grinding of grain requires four to six hours per day per family. A study in the former Congo revealed that tapioca and maize take four times as long to process as to cultivate when measured in work hours (Rogers, 1980:155).

Everyday, women of Haryana, India must grind wheat, cook, clean, and churn milk as well as feed, clean and milk the animals, and collect fodder, fuel, and water (Nelson, 1979:40). These same tasks may take 14 hours each day for a typical village woman in Pakistan (Nelson, 1979:41). Women of Sub-Saharan Africa are responsible for nearly all tasks related to food production and product transformation including trade and marketing (Butler, 1979:8).

As previously discussed, women invariably perform the bulk, if not all, the processing tasks. Even when they do not cultivate a particular

crop, or in the case of pastoralist, tend the larger animals (e.g. camels, and often cattle), they are responsible for any transformation of the primary product. Traditional beer, used for social obligations (bride price, visits, etc.) and as the major source of marketable surplus, is brewed by Rwandian women from bananas grown almost exclusively by men (UNDP, 1980:80).

Among pastoralists in the Sahel, women process and preserve all types of milk despite the fact that men tend the larger animals. Milk and processed milk products, specifically cheese and butter, provide a substantial portion, if not all, of the food supply over many months of the year (Cloud, 1977:10 and Smale, 1980). Kerite nuts (Shea butter), one the largest agricultural exports for some West African Countries, are also harvested, stored and processed to extract the oil by women. The oil is later sold to male wholesalers and traders who further refine the oil and export it (Cloud, 1977:7).

In Pakistan, women may be prohibited from working in the wheat fields, but they construct the grain storage bins and keep track of the surpluses available for marketing. In addition, they pasteurize milk, ferment yogurt, and produce butter within the confines of the compound (Rogers, 1980:160).

2.1.5 Marketing

Marketing is one production task in which great variations in the amount of women's contribution can be found. Although conspicuously absent in some regions, women dominate in others. In Latin America, specifically Paraguay, Peru, Bolivia and Jamaica, women clearly dominate traditional rural and urban markets (Ahmed, 1978:9). As the data in Table 3 indicate, the allocation of marketing tasks in Asia spans the

entire range of possibilities. This is indicated by the presence of 3 x's within the marketing row. (Factors which may contribute to the development of a specific sexual division of labor are discussed below) In Africa, women's involvement in commerce is in part attributable to their customary responsibility for providing food for their children.

As indicated on Table 2, the ECA estimates that 60% of all African marketing is undertaken by women. This degree of participation varies markedly across regions. Sixty to eighty percent of both urban and regional marketing and trading is controlled by women in West Africa (Kisekka, 1981:34). Of the market sellers in Dakar, Senegal, 60% are women. The similar measure for town-trading in Ghana in general is 80% (Ahmed, 1978:9). Similar estimates are found for Zaire, Congo, Dahomey (now Benin) and among the Ewe of Togo Igbo and Yoruba in Southern Nigeria (Suarkasa, 1977:182; Adeyokunnu, 1981 and Boulding, 1975a:23).

In Eastern Africa, the participation rates of women in marketing are generally lower, although Zimbabwe, Malawi, Zambia and the Luo of Kenya are certainly exceptions (Ahmed, 1978:9). Two suggested reasons for the absence of women in the East African market places are the monopolization of markets and trade by the Euro-Asians up until the end of the Second World War, and the historic lack of indigenous towns and centers in East Africa (Kisekka, 1981:35).

A series of studies collected by the U.N.'s African Training and Research Center for Women (ATRCW) suggests that the type of market influences which sex dominates the market place UNECA, 1975:50). Often, male traders will be present or dominate public markets, while female traders will represent a greater percentage, if not all, of the traders in small, open, or periodic markets. An alternative method of marketing

open to women is to sell from their homes (e.g. the Hausa of East Africa). Table 4 summarizes some of the above points.

Like all other production tasks mentioned here, marketing can be extremely time-consuming and burdensome. Women of Zaire walk up to 25 kilometers to the market carrying loads weighing 30-40 kilograms on their backs, while Yoruba women commonly walk 50 miles or more in a week with heavy baskets of produce on their heads (D'Onofrio-Flores and Pfafflin, 1982:92). It should be noted that the women's task of marketing is frequently performed in addition to cultivating and processing the products. Although they most frequently sell their own some women such as the wives of N'Gor fishermen, market their husbands' product as well (UNDP, 1979a:121). The full-time/long distance traders of Ghana, Nigeria, Kenya and Sierra Leone may be more heavily involved in retail trade than the part-time, local market women are (UNDP, 1979a:120 and Adeyokunnu, 1981).

2.2 Variables Influencing Women's Contribution

2.2.1 Introduction

The purpose of including a discussion of variables associated with deviations in the above description of women's contribution to agricultural production is to develop a more flexible and realistic framework of female-farmers' involvement in small-scale, subsistence agriculture. More specifically, the formulation of information concerning the relationships between these variables and the type and extent of work performed by women may assist researchers in developing their conceptualizations (or specifications) of specific systems. This framework may also function as a predictive tool, facilitating analyses

Table 4

Participation in Marketing According to Sex

Area	Male %	female %
Copperbelt (Zambia) (late 1950's)	59	41
Rhodesia (Zimbabwe) (late 1950's)	majority in larger markets	majority in smaller markets
N. Somalia (late 1950's)	-	dominate the open markets
Hausa (Nigeria) (late 1950's)	dominate public markets	trade from their homes
Dakar (Senegal) (1959)	40	60
Brazzaville (Congo) (1963)	34	66
Nigeria (1963)	30	70 (of petty traders)
Ghana (1960)	18	84
Dahomey (Benin) (1967)	11	89

Source: United Nations Economic on Africa, ATRCW's Human Resources Development Division. (1975). "Women and National Development in African Countries: Some Profound Contradictions." African Studies Review. 18(3):51.

of the effects of changes in key variables upon the allocation of labor within a given work/study environment.

With reference to Africa in particular, a current concern among

researchers and policy makers is the existence of a paradoxical labor shortage in the midst of an apparent labor surplus. Uma Lele has identified three key factors which determine the African labor supply and help to explain this phenomenon: seasonality; time-allocation between farm, non-farm, off-farm and leisure activities and the sexual divisions of labor (Lele, 1975:23). It is hoped that the exemplification and discussion of the following section will promote a greater understanding of how these and other factors influence the labor supply. Specifically, the following sections will review the influences of a number of factors including: seasonality, religion, class, male out-migration, technology and capitalization, crop use, education of children and cultural expectations for women. Relationships discussed, however, should not be considered universal but rather a reference for further study.

2.2.2 Seasonality

Typically, field labor demand is highest during the rainy season and the lowest during the dry season (Lele, 1975:23). Fluctuations in the demand for labor are most pronounced for intensive and semi-intensive rainfed cropping systems in short-season climates (Norman, 1979:79). Intensive work effort is required for sowing, the first and second weeding and harvesting. In fact, the requirements for labor may exert so much pressure on the labor force that women who normally follow strict religious laws of seclusion will often be present in the fields to assist during harvest time (Rogers, 1980).

The increase in farm participation is generally at the expense of off-farm employment for men. In contrast, women contribute more labor by reducing their leisure time. Two explanations are commonly offered for

this phenomenon: tasks performed by women tend to require less recuperation; and more importantly, women perform more critical non-farm work, e.g. water and firewood collection and food preparation, which can not be neglected. Women's total daily work hours during specific peak periods can, in some instances, actually double that of non-peak periods (Carr, 1980:3).

Although there is a significant seasonal variation in the hours worked by women, the largest fluctuations occur in the portion of time alloted to specific categories of tasks. The most common alternating pattern is that of field activities on the one hand and processing and water and firewood collection on other. In Burkina Faso, women devote a greater portion of their time to field activities during the rainy season whereas processing food and water and wood collection comprise over 60% of their day throughout the dry season (Carr, 1980:4). In both Kenya and Ethiopia, women may spend up to twice as much time fetching water and firewood during the dry season as compared to the wet season (Carr, 1980:4).

In instances where the total number of workers increases during the peak periods, either through hiring of or assistance from relatives or neighbors, the time devoted to processing and food preparation in general will often increase substantially if the workers are paid at least in part with meals. In addition, participants in exchange labor schemes are usually women. This requires women to work other people's fields as well as their own and their husbands' at specific times in the season. Women do not receive assistance in the cultivation of their own fields, and engage in exchange labor practices only as part of their obligations to cultivate fields belonging to the menfolk. These two

labor arrangements are common throughout much of the Third World.

2.2.3 Religion

Although religious norms may contribute to or mandate the assignment of a specific sexual division of labor, these norms generally do not restrict the actual amount of time an individual works. Furthermore, the extent to which religion will determine the sexual division of labor is a function of its strength and interpretation within a given social environment.

Islam and purdah restrict women from field-work except during harvesting and other peak labor periods. Since African Islam is less strict than Asian Islam, Muslim women of Cameroon, Guinea, The Gambia, Mali, Niger and Burkina Faso are commonly active participants in field work and marketing produce (Kisekka, 1981:33).

Even where restricted, women still process food, control grain storage, care for livestock, maintain vegetable gardens within or close to the compound and fetch water and firewood. In Pakistan, this work may amount to a 14 hour work day (Nelson, 1979:41). Studies undertaken in Asia indicate that:

> In general, there is no difference in participation by women in farm-work and food processing inside the compound, according to ethnic groups and degree of purdah practiced. A difference did show up in the reporting of women's field work... (Rogers, 1980:160).

Many rural Hausa women of Nigeria are subject to Islamic house-seclusion, but they still employ one another for threshing, winnowing, grinding, pounding and processing commercial oils and locust bean cakes. In fact, the Hausa conduct a large trade in cooked foodstuffs prepared by women in seclusion. These same women conduct trade from their homes and own a majority of the small livestock of the region (UNECA,

1975:51).

A World Bank study about the economic participation and decision-making of women in the subsistence sector of Nepal reports that the religious background of a woman influences the sphere of her work (Acharya and Bennett, 1983:8). Those women from Hindu or Indo-Aryan tradition are essentially excluded from market activities. In contrast, for Tibeto-Burman women (largely associated with Buddhism or other indigenous religions), the dichotomy between engaging in household and family farm enterprise on the one hand and local and distant market employment on the other is not absolute (Acharya and Bennett, 1983:8-20).

2.2.4 Class

Class position has been shown to influence both the amount and type of work performed by women. In most studies, rural classes are defined in terms of land holdings, such as landless, near landless, 5 acres or more, etc. In his study of India, John Mellor found that 43% of the agricultural workers of the landless and near landless class (less than 1 acre) were women, whereas for families with holdings in excess of 5 acres, women comprised only 33% of the workers (Mellor, 1976:91). Mellor also cites studies of Egypt and Bangladesh which provided similar observations. Research conducted in Pakistan (Ahmed, 1978), Ethiopia (Carr, 1980) and Peru (Deere, 1982) further substantiate this inverse relationship between class, as measured by land holdings, and women's involvement in agricultural work.

Many of these studies have not only measured participation but have identified relationships between class and the number and type of tasks performed. Carmen Diana Deere found that in Cajamarca, Peru, women of

near landless and small-holder households participated at all stages of production and shared in market decision-making in 40 to 60% of the households studied. Only 9.5% of the women of the middle and upper strata participated in market decision-making, and most of their time was spent on food preparation and domestic chores (Deere, 1982:805). A study in Java showed a similar pattern (Rogers, 1980:165). In both of these cases, the concentration of women's work activities in food preparation was strongly tied to the use of hired labor which, in turn, was directly related to wealth or land holdings.

Castes, which are de facto class strata within a specific culture or religion, may rigidly define a sexual division of labor that may or may not be consistent across economic strata. In Punjab, Pakistan, higher caste Muslim women engage in handicraft production while lower caste women process food and care for livestock (Dixon, 1982:383). In contrast, Cain found that the sexual division of labor was constant across economic strata in Bangladesh (ICRW, 1980:18). In addition to Islam, Hinduism, and Buddhism, some tribal cultures possess their own caste systems and means of distributing labor. These practices may, however, vary widely from one region to another. Caste influence is most prevalent in Asia.

2.2.5 Male Out-migration

The rural out-migration of men has been most pronounced in Sub-Saharan Africa where an exceptionally large portion of the male population is absent for extensive periods of time seeking wage employment in urban centers, in mines or on plantations. Women of Malawi, Mali, Botswana, Mozambique, South Africa and Lesotho clear land as well as construct and maintain fences and buildings, all

traditionally male tasks (Ahmed, 1978:3). In Kenya, women have taken over men's livestock responsibilities and cultivate cash-crops such as coffee (D'Onofrio-Flores and Pfafflin, 1982:37).

The reduction in the absolute number of available workers affects the acreage planted, yields and crop selection. In order to maintain yields, given insufficient labor availability during peak periods and a lack of labor-saving technology, total acreage has to be reduced. Alternatively, if total acreage remains the same, the available laborers will be over-worked, less productive, and yields will be reduced. Furthermore, since time is the most scarce resource for women (laborsaving technology is generally not accessible), they often substitute crops with a high output of starch per labor hour (cassava) for those with a higher concentration of other essential nutrients but less energy (yams). Both the reduction in total output and nutritional quality of the diet have strong implications on the productivity of the work-force, especially for those at or below the subsistence margin.

2.2.6 Technology and Capitalization

Presently, there is a debate within the development field, mainly across disciplines, over whether the introduction of new technology and capital improves the pre-existing agricultural system or merely alters it without guaranteeing the direction of change or who will be the beneficiaries. With respect to the effects upon women's work specifically, it appears that neither capital nor technology possess an intrinsic sex bias, but that methods of implementation and assimilation can and often do. That is to say, the form of technology or capital is generally equally appropriate for men and women, but new or existing institutions inhibit access by women. The purpose of this section,

however, is to simply describe the relationships between technology and/or capital introduced at various stages of production and women's work effort, not to evaluate them.

At the field level, there are three major types of technological innovations which have been introduced to small farmers: mechanization e.g. ploughs (including animal-traction) and tractors; irrigation and high yielding varieties (HYV's) of various crops. For various reasons, mechanical technology is customarily introduced to men. For example, in Tanzania mechanization has been heavily applied to primary cultivation, whereas the harvesting and processing stages have been virtually ignored (Anandajayasekeramet al, et al, 1981:67). Generally, this will have the effect of reducing women's work load only if they are responsible for land preparation. In fact, it can increase women's work if more weeding is required. Ester Boserup, in her study of African and Asian agriculture, has suggested that:

> ...regions, where shifting cultivation is used, men do little farm work, the women do most... where the agricultural system is that of extensive plough cultivation, women do little farm work and men do much more. Finally, in regions of intensive cultivation of irrigated land, both men and women must put hard work into agriculture... (Boserup, 1970:35).

Irrigation tends to increase women's work load by permitting multiple cropping which requires additional labor inputs at all stages of production if labor-saving complements are not simultaneously introduced. The result is an increase in the total hours worked as well as an alteration in the seasonal pattern of time allocation between tasks such as processing and field work.

HYV's require more intensive labor inputs for transplanting and weeding, both traditionally women's work. Because yields increase, the

demand for post-harvest labor also increases. In parts of India, due to the rigid sexual division of labor, the "green revolution" has caused women's labor inputs to expand by approximately 20% (53 days/acre to 63 days/acre) while men's has remained virtually unchanged. Similar changes have occurred in the Philippines (Rogers, 1980:171).

The introduction of field-level technology is generally accompanied by an increase in demand for female labor as noted above. The additional income earned as a result of the technological innovation may benefit women under the right set of circumstances, e.g. if women are less than fully employed or complementary labor saving technology is simultaneously introduced. Women's control over the additional income is equally important, whether the income is in the form of wages, receipts from the sale of surplus or increased output for home consumption. However, some common problems with field-level technological innovation are: 1) women are frequently fully-employed, 2) complementary labor-saving technology is overlooked or unavailable, and 3) innovations are applied to men's cash crops, for which women have labor obligations, but the innovations are rarely devised or extended to women's food crop plots.

As mentioned earlier, where food processing becomes centralized and/or utilizes a larger share of capital inputs, women are frequently replaced by machinery and hired male labor. Probably the most well known case is that of the rice mills in Java. It is estimated that women collectively lost 125 million work days, $50 million in cash earnings and the equivalent of 4 months food consumption per household in income in-kind. No alternative means of employment were provided for women (Collier, et al cited in Eicher and Staatz, 1984:289 and D'Onofrio-

Flores and Pfafflin, 1982:91). Similarly, tortilla making machines in Mexico and oil presses in Nigeria were introduced to men (Rogers, 1980:173).The Nigerian government has also sponsored milk cooperatives and bakeries with strictly male membership and ownership (Ahmed, 1978:9). In Gujerat, India, a modern dairy complex replaced women's traditional butter and cheese production (Multinational Monitor, 1984:21). It should be noted that there appears to be no specific technical reason why new processing technology is not introduced to women who are originally responsible for such tasks.

Growth of consumer goods industries (largely foreign owned) and imports often introduce substitutes for local agricultural products that again are largely produced, processed and marketed by women. Lager and corn beer as well as soft drinks replace local beverages (D'Onofrio-Flores and Pfafflin, 1982:91). Such substitutions have had a pronounced effect on women's production and marketing of traditional beer particularly in Africa. Other substitute goods are bread for millet balls or pressed-cakes, and manufactured goods for handicrafts (Ahmed, 1978:9).

The creation of chain stores, supermarkets and licensed public markets displaces traditional wholesalers, retailers, hawkers and family-run enterprises. Female traders and processors are eliminated by government subsidization of cooperative structures, milling, credit, storage, transportation, etc. The percentage of female traders of Dahomey (now Benin) was reduced from 95% to 85% between 1961 and 1971. Similarly, female petty traders of Nigeria decreased from 84% to 70% of the total in one decade alone (1950 to 1960) (Ahmed, 1978:9).

In parts of Senegal, the only sources of institutional credit are

the grain cooperatives which exclude women from membership (Sene, 1980:16). The Nigerian government has sponsored cooperatives and provided guaranteed prices and markets at large-scale mills for male groundnut producers (Ahmed, 1978:9). When Isoya Rural Development Project was initiated there, Yoruba women, who traditionally are active in trade, were excluded from marketing yellow maize, which had become a men's crop and had replaced women's white maize (Ladipo, 1981:124). In each case, the existence of subsidies for men make it far more difficult for women to compete with their male counterparts. In addition, the source of a woman's initial investment in her trade has in many cultures been her husband or other male relatives; however, government development efforts create an environment for new alternative investments for the men and raise the opportunity costs of their capital. As a result, investment decisions of individual males and/or households may be in favor of a reduction in women's participation based on distorted market conditions.

2.2.7 Crop use: Cash-crops vs Subsistence-crops

For the purposes of this paper, a cash-crop is defined as a crop cultivated primarily for the market. A subsistence-crop, in contrast, defined as crop primarily grown as a food source but one which is marketed when a surplus exists. The term food-crop is synonymous with subsistence-crop.

Typically, men contribute more labor to cash-crops than food-crops. Their share of field work and marketing often increases substantially with the commercialization of agricultural production. A survey of the Eastern Province of Cameroon, showed that while only 6% of the women in the sample managed cash-crops, only 8% of the men cultivated food-crops

(Atayi and Knipscheer, 1980). The introduction of cash crops in the Nyanza Province of Kenya lead to a situation whereby:

> ...livestock production and management - the usual economic activity of men - subsided, and men therefore engaged in food crop production for a cash income... men were recorded plowing, tilling, and participating in the seeding and harvesting of maize, whereas twenty-five years previously they seldom laborered on crops (Barnes, 1983:47).

As mentioned earlier, Yoruba women traditionally were the primary traders of white maize (food-crop), but they were excluded from trade in yellow maize (cash-crop) when the Isoya Rural Development Project was initiated in 1969 (Ladipo, 1981:123). Similarly, rice production and marketing in The Gambia was traditionally considered a women's responsibility. Once an irrigation project that enhanced and promoted the commercial value of rice was implemented, however, men took over the rice marketing (Dey, 1981:117).

Although men frequently manage cash-crops, they may still provide a smaller percentage of the total labor inputs than women do. Women are generally expected to work their husbands' fields as well as their own food-crop plots. Men, on the other hand, do not supply labor to women's individual plots. The above mentioned study of Cameroon found that men's contribution to maize and groundnut production (cash-crops) was less than 50% (Atayi and Knipscheer, 1980:6).

2.2.8 Education of Children

The education of children affects the hours women work because it limits the number of hours as well as the time of the day that children are available to work. Children usually assist with the field work, bird scaring, gathering and livestock activities. Girls also fetch water, wash clothes, look after younger siblings, process food and market

agricultural surplus. In Indonesia, women and girls of the landless classes contribute more to household income than men or boys. This difference increases during the slack season (Youssef, 1980:25). In addition, it is not uncommon in Africa for children to work more hours in agricultural production than adult men. Removing children from the production system, without providing labor-saving technology, can increase women's work burden considerably throughout all stages of production (Carr, 1980:8).

2.2.9 Expectations for Women

Its important to recognize the significance of social expectations for women. These expectations, and the laws created to bolster them, have pronounced effects on both the type and the extent of work women can and are willing to perform. African women are expected to provide food and other material needs for their children. Hence, they dominate food-crop production and actively engage in trade. In Latin America, the mother role is strongly emphasized and wives with substantial leisure time are symbols of success and wealth. Therefore, class and work (especially market activities) are inversely related. Where sexual purity is important girls are likely to be prohibited from attending school, and women are likely to be restricted from work activities which put them at risk of social contact with men. Women may, however, work long hours in "protected" environments, e.g. the home, the compound or sexually segregated enterprises.

2.2.10 Summary

This section has provided an overview of women's agricultural roles in LDC's, and suggested a number of variables that influence the supply of labor over the agricultural season. Women's significant contribution

to agricultural production has been substantiated and patterns have emerged which can provide insights for systems analyses, predictions, and policy prescriptions.

The season influences the total hours worked and the kinds of activities women engage in. Religion restricts women's participation in some specific activities, but not necessarily the hours they work. Class dictates not only the types of tasks but the amount time a woman can or ought to work. (In studying a system, it is important to note that religion and class not only influence the work activities of the subjects, but also the perceptions of the researchers, technicians and decision-makers.) Male out-migration tends to increase women's burden and expand their responsibilities to include men's traditional tasks. Technology is not generally introduced to women. When technology is labor-saving or possesses a substantial capital component, it is customarily introduced to men, therefore, frequently displacing women.

Technology generally does not possess a sex-bias by design, but the methods by which it is introduced often do. Commercialization of agriculture can reduce women's work if the new cash-crops were previously cultivated as subsistence crops that were the sole responsibity of women, and if men contribute more labor to the production of these crops. Alternatively, women's workload can be reduced or can remain constant if labor-saving technology is introduced for women in conjunction with the increase in demand for female labor in cash crop production. If a new crop variety is introduced and women are expected to work both their husbands' and their own plots, their work load is likely increase considerably. If the education of children influences the work of women, it usually increases their burden.

Although these relationships generally hold throughout the literature, they are in no way meant to be considered universal or immutable. They have been included here to provide a reference point for further development of a new framework for female-farmers and food crop production in general.

In the following sections, a review of theoretical concepts will determine whether or not sufficient analytical tools exist which allow for effective formulation of research and policy either directed at or including female farmers working within a semisubsistence agricultural systems.

CHAPTER THREE

CONCEPTUAL ISSUES

3.1 Introduction

3.1.1 Defining a Conceptual Framework for Semi-Subsistence Farms

A conceptual framework is 1) a theory that links elements of a system and explains or describes how that system operates, and 2) a tool that simplifies research, analyses and prescriptions by organizing in some meaningful way, the pre-existing work of other researchers, analysts and policy-makers. The nature and complexity of a framework will vary directly with the nature and complexity of the problem and system studied.

Starting with a micro-level perspective, an analysis of the food security issue would require a framework that discribed small-scale, semisubsistence farms and focused, perhaps, on increasing and/or stablizing the production of, and demand for food with concomitant efforts directed at insuring availability of food in the local markets. Specifically, for production augmentation schemes, family consumption requirements, production alternatives for the farmer and principles of farm decision-making would warrant special attention. With these objectives in mind, an analysis of several primary elements of the farm system would undoubtedly be included. The following list presents basic questions concerning three primary elements of a production system, i.e. outputs, inputs, and the decision-maker, which need to be addressed in order to develop an analytical framework of semisubsistence agriculture.

Outputs:
1. What is produced?
2. How much of each product or service is produced?
3. What is the value of that produced?
4. How is the product or service used, i.e. for commercial or subsistence purposes?

Inputs:
1. What factors (resources) are available?
2. How much of each factor is available?
3. What is the value of each factor?
4. What are the alternative uses of each factor?
    a. Who are the producers (laborers)?
    b. Do producers have other responsibilities?
    c. Do producers have time or energy constraints?

The decision-maker(s):
1. Is the decision-maker(s) the producer(s)?
2. Who makes the following production decisions?
    a. What and how much is produced,
    b. What inputs are used,
    c. What technology is employed.
3. Who decides what and how much is sold?
4. Who decides, and how are, the proceeds from the sale of products or services distributed?
5. Who decides how the product or service is consumed and who consumes it, the producer(s)?
5. Does(do) the decision-maker(s) have(has) other responsibilities?
6. What are the (objectives) of the decision-maker(s)?
    a. Maximization of profits?
    b. Maximization of consumption?
    c. Maximization of output?
    d. Maximization of nutrition or basic needs?
    e. Highest yields?
    f. Tradition?
    g. Other.
7. What are the decision-makers' perceived constraints?

This list of basic questions will provide a reference from which models of the semisubsistence agriculture can be evaluated. In part, the extent to which a given model addresses these questions indicates how useful the model is.

3.1.2 The Classical Model of the Family Farm

The classic model of the small-scale, family farm envisions the family unit and the production unit as one. Generally, the identified "head of the household" will also be considered the "farmer" and the

"decision-maker." When consumption decisions are made, the family aims to maximize joint utility, and when production decisions are made, the family aims to maximize profits. Because the model assumes that family members possess similar or identical tastes and preferences, the decisions of the head of the household are said to also represent the decisions of the family as a whole.

This conceptualization of the family farm is based in neoclassical economics, which is implicitly based on western societies and specifically on "the theory of the firm." This kind of analysis is convenient in that it standardizes both theory and methodology, simplifies the model of the farm and permits easy integration of farm studies with other economic studies. Nevertheless, it neither provides an accurate representation of semisubsistence farms, or generates sufficient analytic tools for understanding decision-making processes.

Among some of the obvious limitations of this classic model are the following. Wives of polygynous marriages may manage distant and economically independent farms linked only through a common migratory husband. Typically, however, all members of a polygynous marriage are classified as one family with the husband listed as the head of the household. Under such circumstances, it is difficult to imagine that this migratory head of household is the farmer and decision-maker as well. Throughout much of Africa, women, not men, are responsible for providing their children with food. In such a case, it is unlikely that men and women will have identical preferences. Therefore, the head of households' decisions will not reflect those the women would otherwise make. The classic model of the farm family does not address intra-household, or inter-household, dynamics. With respect to the above list

of basic questions, this model ignores most of the components of the decision-maker element. (More information concerning neoclassical economic theory is contained in section 3.2.2).

As stated previously, a presupposition of this paper is that a better understanding of subsistence production system, and specifically women's contribution to this system, needs to be developed to institute effective and consistent policy that will at increase and stabilize food crop production. What is needed is a framework that is specific to small-scale, semisubsistence agriculture and that encompasses the full system, allowing for analysis of both activities (farm enterprises) and institutions.

Presently, such a framework does not exist, nor will this thesis present one. Instead, the next section of the thesis will critique some concepts and standard practices, and introduce and discuss alternatives. Specifically, the following section will consider two issues: 1) What is production and how is it measured, and 2) What is a household and how useful is it as a unit of study. Suggestions concerning appropriate definitions of production and the unit of study will be provided.

3.2 Production

3.2.1 Definition

The concept of production has undergone a historical evolution, starting with a narrow market definition and progressively including more non-market activities and new classifications of work (part-time, unpaid, etc.). Standard statistical practices follow the International Labour Office guidelines and define production in terms of National Income Accounts, i.e. that which increases national income. Consequently, production is limited to goods and services exchanged in

the market.

National censuses typically count only "economically active" individuals, that is, people who work for pay or profit or who are actively seeking employment during a specific period of time; usually a day or a week prior to the census (Ladipo, 1981:11). Some censuses require a person to have worked at least 15 hours during the prior two weeks in order to qualify as active (Beneria, 1981:13). Because these definitions exclude a variety of producers, national production is underestimated. Excluded from these statistics are: 1) family based production, 2) subsistence production, 3) seasonal or cyclical employment, 4) variable work day production, and 5) separate enumeration of multiple tasks performed simultaneously. For a Third World country, these omissions could represent over half of the total production; here the term total refers to formal and informal as well as market and non-market production.

To portray production activities of Third World countries more accurately, national and international data collecting agencies have been establishing new standardized classifications of work over the past several decades. The "gainful worker approach" incorporates sporadic and seasonal workers by classifying people according to their "...usual activity over the past year" (Ladipo, 1981:11). "Unpaid family labor" refers to a person who contributes at least one-third of his or her normal work hours to non-domestic activities, in an economic enterprise operated by a family member (Boulding, 1983:288).

Underlying all of the above definitions of production is the market. Only financially remunerated work, or activities that directly contribute to the creation of marketed output, are included in

production. According to such definitions, the added value derived from the transformation of kerite nuts to shea butter (a marketed good) is production, whereas added value derived from the transaformation of grain to flour for home consumption is not.

Alternative definitions of production that account for non-market activities exist but, with the exception of that of the United Nations' Food adn Agriucltural Organization (FAO), are rarely utilized for national or international data collection. Regional, micro-level, farm budget and single commodity studies as well as some agriculture censuses are more inclined to incorporate those activities missed by the National Census.

The "marketable good approach" encompasses both goods that could be marketed, although for some reason they are not, and the labor used to produce these goods (Beneria, 1981:19). This definition, however, still excludes those goods and services for which there are no markets.

According to FAO's work or production includes:

> ...feeding and caring for livestock and poultry; working in the field; working in the market or kitchen gardens; planning farm work; supervising other agricultural workers; keeping farm records; taking farm products to market; bringing feed, fertilizer or other supplies from town to the holding; repairing fences, farm equipment, machinery, etc. (UNFAO, 1977:45).

Although the FAO approach includes some non-market services for which typically no markets exist, e.g. transportation of inputs and outputs, repairs, farm record keeping, there are a number of services are still excluded such as storage and processing.

"Home production," on the other hand, includes all non-market activities and things which yield utility. Home production, according to Reid, is all unpaid activities undertaken by and for the members of a

household that might be replaced by market goods or services if circumstances such as income, market conditions and personal inclinations delegate them to someone outside the household Nelson, 1979:35). This definition eliminates the strict economic separation of both production and consumption and work and leisure, while it allows for the incorporation of a wide range of activities which contribute to people's well being. Table 5 provides a summary of which production activities each definition incapsulates.

Table 5

Summary of Production Activities
Incoporated in Production Definitions

	Economically active	Unpaid family labor	Marketable output	FAO	Home production
wage income	X				
unrenumnerated family labor in commercial activities		X		X	X
unrenumnerated family labor in potentially commercial activities			X	X	X
unrenumnerated family labor in activities with no commercial outlet					X

source: compiled by the author.

3.2.2 Policy Objectives and Relevant Definitions

Through the determination of which aspects of the economy are counted and what kind of data is collected, the selection of production definitions modifies information, and therefore, profoundly effects the work of researchers, analysts and policy-makers. With respect to the definitions discussed above, i.e. economically active, unpaid family labor, marketable output, FAO and home production, a few useful observations can be made. Starting with economically active, each definition incorporates more non-market activities than the definition which preceded it. In addition, the definitions include progressively more activities which contribute to people's welfare or standard of living. Finally, the definitions provide a progressively boarder view of resource use, indicating which resources are fully employed, underemployed, overemployed, mobile, etc.

Economically active is the most limiting definition. With the introduction of an unpaid family labor category, there is a tremendous increase in the female participation rate. This increase of course depends on the country or region as can be seen in Table 6. For countries with high rates of unpaid family labor, a simple definition like economically active does not provide sufficient information about the work women perform. Seasonal labor bottlenecks and inelastic demands for labor in certain critical activities, especially women's, are likely to be overlooked.

Data collected using the marketable goods approach would include field level and livestock activities associated with subsistence production, and FAO agricultural censuses would capture some additional

Table 6

Incidence of Unpaid family Labor

Region	% of females who are unpaid family labor	
	High	Low
Sub-Saharan Africa	76 (Liberia)	33 (Botswana)
South/Southeast Asia	69 (Rep. of Korea)	21 (India)
Latin America	70 (Puerto Rico)	10 (Nicaragua, Honduras, Guatemala, Costa Rica)

Source: Youssef, Nadia H. (1980). "Sex-Related Biases in Census Counts: The Question of Women's Exclusion From Employment Statistics." In ICRW. (1980). Priorities in the Design of Development Programs: Women's Issues. Washington, D.C., ICRW:10).

services. Nevertheless, processing for home consumption, water and firewood collection, food preparation, home construction and repairs, and production of handicrafts or food crops that do not have available markets would all be excluded. Only with inclusion of home production is the full range of non-market production and women's contribution really understood.

To clarify the type of influence that these definitions have on research and policy, a brief discussion concerning the appropriateness of production data with respect to two common policy objectives is presented below. The objectives are as follows: 1) poverty relief and improving the standard of living of the rural poor, and 2) enhancing agricultural production for improvements in micro-level food security.

As part of the efforts to alleviate poverty and improve the standard of living of the rural poor, policy-makers frequently attempt to target sectors of the economy where there is a great deal of unemployment and underemployment. Policy formulated from data collected using market oriented definitions of production, however, will not necessarily reflect the society's needs, and people may be unresponsive

to employment generation schemes if they are already engaged in purposeful activities.

To determine target groups and the standard of living of rural inhabitants, it is necessary to establish what people produce for home consumption as well as what is they acquire through the market. The distribution between market and non-market production will depend on the stage of development, the reliability of markets for specific necessities, the orientation of government spending and the competitiveness of rural based production as well as other factors. If there are markets for the majority of the goods and services, the marketable goods approach can provide a significant portion of the information needed. But, health care, water, home construction and repair, informal education, child care, and many other activities performed by women and contributing to the welfare of rural inhabitants in LDC's are not found in the market. To account for these activities, the home production approach needs to be employed.

For Third World countries with substantial non-market activity, these measures that capture only market activities can be highly inappropriate. Statistics from the Organization of Economic Cooperation and Development (OECD) indicate that subsistence production not counted in GNP represented 20% of GNP for 40% of the 48 Third World countries for which data were collected in the 1970's (Garabaghi, 1983:673). The greater the proportion of activities taking place outside the market, the greater the underestimation of both total production and the degree of participation of various groups.

The second policy objective, increasing food production and improving food security, requires a substantial amount of production

data. The unpaid family labor approach will most likely neglect or underestimate the production from subsistence plots cultivated by women. Extension, marketing and technology transfer programs designed from data collected according to this definition, are apt to exclude subsistence plots. The result may be to counteract the food security objective, promoting production for consumption needs outside the production area (e.g. urban areas or overseas) and applying additional stress on production of local food.

The marketable goods approach will count most subsistence agricultural production, and identify family labor use in these activities. It will fail to identify, however, many of the constraints facing producers. Female producers have time and energy constraints associated with their responsiblities for other tasks such as livestock maintenance, marketing, processing and preparation of meals, etc. Marketing and livestock tasks might be identified because of the relation or potential relation to the market, while the other activities will probably not be identified.

Given this limitation, programs to expand the amount of land under cultivation, to improve yields through intensification of family labor use (e.g. introduction of fertilizer), to relocate production to more distant fields or new regions, or to transfer male producers to wage employment are apt to fail or be less effective. In addition, information gathered by the marketable goods approach does not cover distribution of food within the household, or explain decisions concerning whether or not a particular food product will be marketed. The home production approach would be helpful given the need for such information.

What has become apparent through these two examples is that the use of the concept of home production should be more fully explored and extensively employed. Three basic characteristics of home production make it an attractive tool. First, it provides a thorough description of resource use. It identifies the multitude of enterprises within a farm system and establishes their interdependencies, e.g. input competition and vertical integration. Time allocation studies, commonly used with this approach, indicate the degree of flexibility and transitivity of labor. This approach also draws attention to women's contribution.

Second, incorporation of home production can elicit the interaction between market and non-market production. It is possible to identify some of the variables which cause rural people to produce for the market rather than for the home. Production for the market is synonymous with surplus production. Therefore, this method may lead to identification of variables through which policy-makers can influence the creation of surplus and contribute to the food security objective.

Finally, the home production approach expands the definition of economic production beyond economic growth and capital accumulation. It includes those goods and services which contribute to people's well being and improve their standard of living.

3.2.3 Theories of Home Production

Neoclassical theory was developed to interpret Western industrialized economic systems. It does not specifically explain non-market activities, home production or semisubsistence economies of LDC's. Instead, the theory was simply extended to incorporate these activities. Originally, the household was explored with the intention of identifying the causes of female labor movements between the household

and formal, market employment. Later, when interest developed in quantifying domestic production, application of neoclassical theory branched into time allocation studies, estimation of the market value of output and fertility analyses (Beneria, 1982:130).

The neoclassical criteria for determination of what types of production activities, i.e. creation of time, space and form utility, are economic is rooted in mercantilist philosophy. The mercantilists were concerned with that which contributed to capital accumulation and growth (Deane, 1978 and Fusfeld, 1977). Hence, production that occurs within or for the market is considered economic activity, and its exchange value, or price, becomes the measure of worth of that specific good or service (Beneria, 1981:16). On the other hand, production undertaken within the household, for household use, is not classified as an economic activity even though utility is derived from these goods and services. In fact, production within a household is often referred to as consumption because activities are undertaken for immediate consumption without any direct relation to capital or capital accumulation (Beneria, 1982:131).

According to neoclassical theory, the classification of an activity as economic or non-economic determines whether the creation of time, space and form utility is production or consumption respectively. And, an activity is classified as economic if it is linked to the market. Therefore, food prepared in a restaurant is considered economic production, while that produced within the home is consumption. Industrial processing of agricultural output is also economic production, while the threshing and grinding of grain or the churning of milk to butter by Third World rural women is not.

Some obvious problems exist with this perspective are as follows. First, a classification of production that is limited to the market, may better reflect the stage of economic development of a specific economy or geographic area than identify those activities which contribute to the creation of utility. Second, if only a small portion of the total output of a given economic system is exchanged in the market, the prevailing market prices may not accurately reflect the supply and demand conditions of the various goods and services produced. Finally, although exchange values reflect the usefulness and the scarcity of a good or service, they also assume a given distribution of property rights both among and within households.

Neoclassical theory is, nevertheless, oriented toward problem solving. Consequently, the theory provides some tools for policy prescription. It also allows for quantitative analyses of the market components of a system as well as limited extrapolation to various non-market elements.

Like neoclassical theory, marxist and feminist theory are oriented toward western industrialized societies. Both marxist and feminist analyses of women's economic role have focused on unpaid household production. For both, women's roles in reproduction and in the daily maintenance of the labor force is central (Beneria, 1982:130). Home production is seen to be linked to capitalist accumulation because it reduces the cost of labor used in commodity production. In addition, women in the home act as a reserve army of labor, thereby alleviating the upward pressure of wages under an otherwise limited labor supply.

For the most part, marxist analyses of development have emphasized macro-economic elements and relationships, e.g. Samir Amin, Paul Baran,

Andre Gunder Frank, Celso Furtado, Walter Rodney and others. Feminists, in contrast, have focused on the history, causes, functions and effects of women's oppression (Maquire, 1984). Neither analyses address women as producers in their own right with responsibilities and objectives of their own.

Both Marxists and Feminists do, however, argue that the present distribution of income and wealth, institutions and the social relations of work and exchange are crucial to analyses of production systems. Altough their theories lack the analytical tools or have not been sufficiently refined to provide concrete policy prescription, the discriptions of economic systems and the links between various components of these systems are both thorough and highly sufficiated.

The above discussion identifies a few strengths and weaknesses in the existing theoretic frameworks. Although each theory contributions important information to the analysis of semisubsistence agricultural production, both overlook critical components of the system.

In order to assist research and improve policy prescriptions, there are a number of key issues that need to be addressed regarding semisubsistence production, and specifically female-farmers working within this type of system. First, production definitions need to be broadened to incorporate home production. Exclusion of these activities renders the economic analysis incomplete, particularly when a large share of the production activity takes place outside the market. In addition, the concept of exchange must be extended to encompass two distinct yet interrelated levels of exchange: interhousehold, whether market or nonmarket, and intrahousehold. The intrahousehold level of exchange includes distribution and decision-making within the household,

identifying decision-making characterists unique to specific members. Third, theoretic frameworkd need to be expanded to include endogenous institutional variables. Finally, theory and analytical tools must be developed to deal with a broad concept of human well being; one which extends beyond commodity production and the identification of individuals' preferences solely through market responses.

3.2.4 Valuation of Home Production

Related to the problem of accounting for production activities is the selection of appropriate methods for the valuation of goods and services. The selection is critical in that a given task or output will receive policy emphasis in direct proportion to its assigned value. The techniques typically employed can be separated into output and input methods.

3.2.4.1 Output Approaches

The search for a output valuation method usually begins with market prices: the price of a good, its price in a nearby market if a market does not exist locally, or the price of a substitute in either consumption or production, e.g. wheat and rice may be substitutes in consumption but generally not in production, while wheat and corn are often both production and consumption substitutes (Gittinger, 1982). The substitute commodity chosen will depend on the perspective of the individual consumer or producer. Unfortunately, in the case of semisubsistence production, where the individual is commonly both, identification of the appropriate price is often ambiguous.

Market price evaluation methods also apply to services. Certain positions, however, such as domestics, clerical workers and office managers encompass a set of services, which render the identification of

distinct outputs difficult or impossible. Under such circumstances, there are two basic approaches used: global replacement and related consumer expenditures (Goldschmidt-Clermont, 1982:5). The global approach would entail identifying alternative sources of the same set of services. For example, the value of a domestic servant who cooks, cleans, launders, processes food, gardens, shops and watches over children and the household may approximate much of the home production of women. Alternatively, valuation according to the expenditure approach would sum all costs of services as though they were executed independently, e.g. specific meal costs, processing costs, day care expenses, etc.

There are a number of problems associated with these output methods. Both approaches assume that market and home production employ similar technology, and that their outputs are of equal quality. In addition, if there are nearby, but no local, markets, it is logical to assume that the supply and demand conditions vary in the different areas. Therefore, prices in the nearby market do not necessarily reflect the local valuation of production. Finally, the related consumer expenditure approach assumes that specialization exists for all tasks, which is very unlikely in most LDC's, and that there are no gains accrue from specialization, and that the quantity produced would be the same whether the price were paid to someone else or ones self.

3.2.4.2 Input Approaches

Methods of input valuation are frequently employed to impute the value of home production. Input valuation methods are based on the assumption that the value of a good or service can be derived from its cost of production (Deane, 19778:27). For a semisubsistence economy,

labor is generally the major contributing factor of production. Therefore, the input methods discussed here will focus on labor inputs. These methods also rely heavily on the market for information concerning the value of labor inputs, i.e. wages. An appropriate wage is generally chosen from among the wages of substitute workers, workers with either similar market functions or job qualifications, and the average market worker, or one equivalent to the summation of in kind, non-cash benefits received by home producers (Goldschmidt-Clermont, 1982:5).

All of these methods assume equal productivity between home and market production. However, the neoclassical principle of specialization suggests that the specialized market substitute has a higher marginal product than the unspecialized home producer (Ferguson and Gould, 1975:208). Other researchers in the field of domestic production argue that the home producer's output is greater and of higher quality than that of a hired substitute (Goldschmidt-Clermont, 1982:14). In addition, it is inappropriate to assume that a household could afford or manage the entire specialized staff required to substitute for all home production activities. Another important limitation of market valuations of home production is that only the monetary value of work is captured in the measure. The substantial difference in emotional and social rewards to home producers, on the one hand, and market workers who provide family services through the market, on the other hand, is ignored or assumed negligible or limited analytical significance.

An alternative approach to input valuation is to measure the opportunity costs of labor, i.e. the benefits derived from the next best alternative that are forgone because of participation in the present activity (Brown, 1979:59). This approach, unlike those mentioned above,

does not attempt to identify a source of direct valuation of the production activities in question. Instead, it assumes that an activity presently undertaken is at least as valuable as the next alternative, otherwise, it would not be undertaken. The opportunity cost of labor is generally determined by one of the following two methods: the "forgone market wage" or the "forgone output approach."

The forgone market wage approach is based on the theory that in equilibrium the value of the last unit of market time is equal to the last unit of non-market time. The validity of this approach rests on four assumptions: 1) the laborer follows rational utility maximizing behavior, 2) the laborer is well informed, i.e. there is perfect information, 3) the laborer makes choices in a perfectly competitive market, and 4) equilibrium conditions are actually reached (Goldschmidt-Clermont, 1982:23).

The fulfillment of these assumptions, specifically the perfect information requirement, is unlikely for the semisubsistence sector of a LDC. Also, there are frequently rigidities in time allocation and a person is unable to make marginal shifts between market and non-market activities. Employers generally establish a minimum level of work hours.

Even if the assumptions were fulfilled, the earning capacities of different home producers, based on the their skill level, might be completely different. Consequently, valuation of a given task such as weeding would vary directly with different women's potential market wage rates even though these wage rates do not reflect the women's weeding productivity. In addition, seasonal fluctuations in the wage rate resulting from a seasonal demand for labor, government wage regulations and market imperfections may all cause the wage rate to deviate from the

marginal value of labor. Under these circumstances, the market wage rate would not be an appropriate measure of the value of labor inputs (Gittinger, 1982).

Deriving the value of a productive activity via the output forgone approach requires the determination of either the marginal value of the specific production agent, i.e. labor (Vincent, 1962), or the marginal returns to the larger family farm unit (Brown, 1979:62). The concept of marginal value product (MVP) is based on the "Theory of the Firm." (For information concerning the derivation of the MVP of a factor, see Chaing, Hirshleifer or Vincent).

3.2.4.3 Conversion Factors

One final method employed to value labor inputs to production is the application of conversion factors. Conversion factors transform one type of labor into some fixed scalor of another. Establishing one type of labor as the numeraire allows for comparisions among and aggregations over the entire array of labor inputs of a system. For example, Rapeepun Sektheera chose men as the numeraire for her study of family resource allocation in Northern Thailand, and assigned factors of .72 and .6 to women and children respectively. She found that women's labor accounted for 47% of crop production and 38% of total production (Sektheera, 1979:236).

Chinese and Vietnamese convention has established a weight of .6 for women (Garrett, 1982:48), while the Lilongwe Land Development Program (LLDP) used .67 as the man unit equivalent for women over 13 years old (Rogers, 1980:71). The Upper Volta Authority (AVV) used a weight of .75 for adult women, and sexually differentiated weights for both the elderly (over 55 years old: men =.5 and women =.25) and

children (between 12 and 15: boys =.5 and girls =.25) (Gladwin, et al, 1984:30). Atayi and Kanipscheer employed "...the following arbitary weights" (Atayi and Knipsheer, 1980:43):

Men 19 years and older (numeraire)	= 1
Women 19 years and older	= 1
Men under 19	= 0.75
Women under 19	= 0.5
Children under 15	= 0.25

W.Y. Yang attempted to standardize conversion factors assigning weights of 1 for men, .8 for women and .5 for children (Brown, 1979:52).

The conversion factor approach implicitly assumes that there is greater variation in productivity among age and sex groups than there is within these groups. There is no specific evidence, however, to warrant such an assumption. The assignment of weights for the most part is arbitary.

> Experience throughout the world has shown that it is a fallacy to assume that a woman's effective output is always less than a man's. Besides, work assignments on the farm are highly specialized. Some jobs are assigned to women not merely because they are " a woman's work" in the derogatory sense, but because a woman's productive capacity at such jobs has proved to be greater than a man's (Brown, 1979:53).

More appropriately, the actual hours worked by different people should be used. Dunstan Spencer suggests that all adults should be given a weight of 1, and children between the ages of 7 and 15 should be given a weight of .5 (Spensor, 1977). If this set of factors had been used in Sektheera's study, women's contribution would have increased to 65% for crop production and 53% overall.

LLDP records reduced the female labor force from 1,057 to 708 through the use of the .67 conversion factor mentioned above. Since the male labor force totaled 802, the use of the conversion factor changed

the dominant labor force participants from women (totaling 1,057) to men (totaling 802) (Rogers, 1980:71). It is important to recognize that these arbitary weights, which discriminate between male and female labor, have been employed in a large portion of the existing studies. Should labor input figures of these studies be re-estimated using Spencer's method, women's contribution and productivity would undoubtedly increase significantly, enhancing the value of their contribution to production. It is quite possible that as the recognition of women's contribution to agricutlural production increases, research and policy efforts may place greater emphasis on women as producers or economic agents, reflecting the proportionate contributions of both men and women.

3.3 The Household As a Unit of Study

3.3.1 Household Models

There is always a subject to which research and policy is directed. This subject is referred to as "the unit of study", and for small-scale agricultural research and programs, the unit generally is the family farm or "household." The collectivization of the target population into household groups, and the subsequent designation of a group member as the "head of the household," reduces the extent of data collection and communication required of researchers and policy agents. Although this procedure simplifies analyses and policy implementation, it can frequently misrepresent the actual production system, rendering analyses inaccurate and policies inoperable. Standardized definitions of the household or household head are often incongruent with the realities of the target population (see Yanagisako for a review of household definitions).

Jane Guyer suggests that there are two basic models of the household: 1) the corporate unit, which is comprised of a lineal group legally bound together by collective ownership, responsibility and representation, and 2) the immediate unit based on co-residence, production and consumption (Guyer, 1981:5). The standard definition of the household, based on the Eur-Asian social context where religious, legal, ideological and tax units share consonant boundaries, encapsulates both of these units.

Similarly, the neoclassical family farm model (the classical model discussed earlier) focuses on the intricacies of commodity flows, and attempts to explain the interdependence among production, consumption, budgetary and investment units within a farm system. The household is considered a decision-making unit, which is directed by the head, and determines the desirable level of labor inputs in accordance with "a household preference for leisure and commodities" (Guyer, 1980:2). According to farming systems research guidelines, the household:

> ...comprises the farmer and other members of the family, is both a consuming and producing unit, and is a social organization. Households are often under the management of a single person, but sometimes operate collectively. Members normally live and sleep in the same place, share meals and divide household duties (Shaner, et al, 1982: 214).

The theory which integrates production and consumption economics is referred to as "new household economics" (Guyer, 1981:98).

Chayanov developed a slightly different model of the family farm (Hunt, 1979; Thorner, et al, 1966 and Dixon, 1982a). He claimed that the household is a self-contained unit of production and consumption, relying solely on its own labor power. The household's demographic structure, measured by the dependency ratio, changes through time.

Consequently, the intensity of production alters in order to maintain a specific level of consumption.

Alternatively, Sanjek defines a household strictly in terms of co-residence. He states that a household is a:

> ...group which occupies the same staging area for social life...the set of persons (or the person) who sleep, store possessions, and refurbish themselves in the same rooms...(Sanjek, 1982:81).

This definition is based on his observation that production and consumption frequently take place in different locations.

All of the above models, with the exception of Sanjek's, assume that resident, production and consumption units all have consonant boundaries. Polly Hill, however, claims that husbands and wives in West Africa seldom work together in the same production activity (Guyer, 1980:5). Household land of central Burkina Faso can be divided into separate categories according to who is responsible for cultivation of specific fields. Twenty-one percent of the land is cultivated by women, 12% by men, and the remaining 67% is cultivated jointly (Gladwin, et al, 1984:6). Gladwin and Almy suggest that:

> ...farming households in many African societies should be characterized as farm firms with overlapping but semiautonomous production and consumption units within the firm (Gladwin and Almy, 1984:16).

This observation is consistent with the virilocal residency pattern of Kenya. Each wife is given a field and a certain number of livestock. Because the resources belong to their common husband, and therefore the women are all under his jurisdiction, their separate households act as subunits of one grand household headed by their husband (Barnes, 1983:44).

In Africa, households have more than one decision-maker. Men and

women often have distinct ownership and inheritance rights, they work in different economic spheres, and manage their own personal incomes. Among the Yoruba and the Hausa, for example, women and men do not share a common budget (Guyer, 1980:4). Norman and Simmons found that Hausa men and women had different sources of income, different patterns of income expenditure and little knowledge of one another's financial matters (Guyer, 1981:17).

Guyer points out that Ashanti men and women have separate homes and separate businesses, although they share consumption in that the women send prepared food to their husbands each night (Guyer, 1981:6). Even according to Sanjek's co-residence definition, it is difficult to define a household because people are extremely mobile across residences (Guyer, 1980:5).

3.3.2 The Concept of Household Head

The title "head of household" normally confers to the designated individual the responsibilities of spokesperson, guardian and manager of all other members. This prototypic head of household, however, may be inconsistent with the socio-economic structures of the study group. Furthermore, ambiguous and/or restrictive definitions hinder the identification of the real head of the household or head of specific activities.

According to the U.N., "The head of household is that person designated as such by household members." In the 1970 Brazilian Census the head was defined: "...that person responsible for the family" (Buvinic and Sebstad, 1980:39). Neither of these definitions explicitly states the reponsibilities of the household head. Thus a slightly more explicit alternative definition is to designate the head of the

Table 7

Households Headed by Women

Location	Portion of total households (%)	Source
Africa		
Botswana (overall)	46	125
(some villages)	80	216.56
Chad	24	41.92
Congo	21.3	41.92
Gabon	20	41.92
Ghana (overall)	33	171.90
(rural Eastern)	40	216.57
(Southeast)	50	139.34
(Tsito)	41.9	37.111
Kenya (overall)	31	139.34
(parts)	40	125
(rural)	33	171.90
Malawi	75	40.9
Mali	17	41.90
Morocco	21.8	41.90
Mozambique	25.2	41.93
Lesotho	>30	46.5
South Africa (rural)	71	179.9
Swaziland	71	179.9
Tanzania	51.1	31.38
Togo	20.2	41.93
Uganda	20.3	41.93
Zambia	47	23.7
Asia		
India	18	125
Indonesia	23	41.93
Iran	15	125
Vietnam	24.6	41.92
Latin America		
Barbados	41	41.99
Belize	24	41.99
Chile	32	41.87
Colombia	25	41.87
Costa Rica	16.4	41.10
Dominica	43	41.99
El Salvador	29-45	64.4
Grenada	46	41.99
Honduras	26	41.87
Jamaica (overall)	35	53.11
(Kingston area)	>50	53.11
Panama	40	41.87
Venezuela	25	41.11
Virgin Islands	37	41.11
Central America	20	41.39
South America	15	41.39
Sub-Saharan Africa	22	41.39
World Average	25-30	40.40

Source: numbers correspond to bibliographic source and page number.

household as:

> ...that person who generally provides the chief source of income for the household unit, or who is regarded as such by other household members (Buvinic an Sebstad, 1980:39).

The problem with this definition is that men are expected to provide for their families whether or not they actually do. Therefore, despite the fact that women are increasingly becoming the de facto heads of households with full responsibility for their children, men are often still regarded as the head of the household (UNESCO, 1981:11).

Table 7 includes estimates of the extent of female headed households throughout the world. An estimated 25-33% of all households are headed by women (Butler, 1979:11). Figures extracted from Buvinic's study (source number 41), exclude households headed by women due to male marginality, abandonment, or male seasonal migration because: "the marital union is often considered intact" (Buvinic, 1978:37). Buvinic's estimates should not be compared with those of other sources, especially where migration or polygyny are dominant contributory factors, e.g. Botswana, Malawi or Ghana.

3.3.3 Factors Contributing to the Incidence of Female Headed Households

A review of the literature suggests that there five factors that contribute to the high and/or increasing incidence of female headed households in LDC's: migration, urbanization, polygyny, instable mating patterns and dissolution of marriages through divorce, abandonment or widowhood.

The high rate of male out-migration from rural villages to distant mines, plantations and urban centers is a major cause of the high incidence of female headed households, especially in Southern Africa.

About one third of all adult Malawian males live outside the country (UNECA, 1975:56). They are largely seeking employment in South African mines along with men from Mozambique, Swaziland and Lesotho; approximately one half to two thirds of adult men of Lesotho work in the mines (Uphoff, et al, 1979 and Gordon, 1981). The extensive migration of men to urban areas and South Africa has resuldted in a rate of female headed households in rural Swaziland of 71% (Safilios-Rothschild, 1981:9). In Tanzania and Mozambique, men migrate to plantations, leaving their families behind and often providing no support in the form of a remittance (Anandajayasekeram, et al, 1981:70). Similarly, male seasonal laborers from Burkina Faso, Mali and Guinea migrate to the mines and plantations of Ghana, Ivory Coast and Nigeria (Sudarkasa, 1977:180).

Female headed households also result from the migration of women. In Latin America, women migrate to urban centers at a higher rate than men (Buvinic, 1978:79). Exclusion of women from plantation wage employment, increasing scarcity of available land for subsistence production (e.g. the minifundio) and opportunities for employment as wage laborers in the urban tertiary sector or as informal domestic servants all provide incentives for women to migrate to urban centers, frequently with their children and without their husbands.

Women of Ethiopia, Tanzania and Madagascar also migrate at a higher rate than men (UNECA, 1975:56). Yoruba and Igbo women of southern Nigeria, Ewe of Togo and Ghanaian women actively participate in long distance international trade (Sudarkasa, 1977:183). In contrast to Latin American women who migrate due to resent developments in urban employment, West African women's primary motive for migration, and their consequent independence, is their traditional role in international

trade.

"Nontraditional" mating patterns also influence the extent of female headed households. In the Caribbean, the cohabitation of men and women is frequently established on a noncommittal and/or irregular basis. However, children are customarily the responsibility of women (Buvinic, 1978:6). Two common female household structures found in Latin America are: 1) the matrifocal unit in which a woman and her children work collectively, and 2) the "queen bee" unit, which is comprised of one woman who acts as the head and the housekeeper, her single working daughters and their children (Buvinic and Sebstad, 1980:41).

In Africa, several women often form collective households, and independent female householders have long existed in many areas. In the Buganda region of Uganda, women set up independent households because they are divorced, widowed, deserted, or "...simply tired of being married" (Obbo, 1980:88).

Finally, polygyny is a common cause of the high incidence of female-headed households in Africa. Although not all polygynous marriages result in separate households for each wife, many do. Figures from several African countries that illustrate the large percentage of female-headed households resulting from polygynous marriages are as follows: Nigeria, 63%; Uganda, 45%; Sierra Leone, 51%; and Senegal, 21-24% (Boulding, 1975a:122).

3.3.4 Household Heads as Financial Providers

The western concept of the family consisting of one head of the household, usually a man, who is both the main economic provider and the ultimate authority is frequently an unsuitable model of the family in

Colombia, Costa Rica, Mexico and Venezuela revealed that their incomes amounted to 50% of the total family income (Youssef, 1980:25). A World Bank study found that women of Nepal contribute 50% of the total household income and 54% of the home production (Acharya and Bennett, 1983:43). Surveys of rural families in Botswana, Burkina Faso and Burundi showed that women work longer hours than men, and that the economic value of home production activities of women and children contribute significantly more to the family income than men's own income (UNESCO, 1981:10). Other surveys of Yoruba families revealed that one third of the women did not receive financial support from their husbands, and in Swaziland only two thirds of the women with migratory husbands received a regular cash remittance (Carr, 1980:5). Furthermore, Fion de Vietter found that:

> In fact, women farmers often end up supporting their city-based husbands in the form of sending farm produce to them (Carr, 1980:5).

Interviews with Beti families of Cameroon showed that 80% of the value of food and beverages consumed by the household were produced within the home (Guyer, 1980:9).

Throughout much of Africa and in certain matrilineal societies of Southeast Asia, women have exclusive responsibility for the welfare of their children, and are expected to feed the children, their husbands as well as themselves (ICRW, 1980a:5 and Barnes, 1983:44). Within Africa, women are generally expected to provide for the daily maintenance of the family, while men contribute to the maturation of children, i.e. their education, initiations and marriages (Guyer, 1980). This pattern is illustrated by both Beti women's intensification of production under the traditional system and Genieri women's initiation of rice cultivation

following their menfolk's switch from grain to groundnut production, both are strategies for maintaining family food supplies (Guyer, 1984:33).

Dey's study of the Gambia illustrates a common pattern of African household expenditures (Dey, 1981:112). Women pay for all production inputs for their fields, purchase cooking condiments, medicines, household utensils, personal needs such as perfume, and contribute their labor to reciprocal work groups. They also purchase jewelry for their daughters and make contributions to their dowries. Men and women buy their own clothes, and men make contributions to the rental fee of a tractor for ploughing women's fields when there is a good harvest.

In the Segou region of Mali and many cattle herding areas of Mauritania (Smale, 1980) a similar pattern is found. Women are responsible for the main meal, sauces (food which accompanies the grain), spices, medicines, school supplies and clothes for the children. Wives of a polygynous marriage share the responsibility for or independently provide the main meal (Caughman, 1981:6; Smale, 1980 and ICRW, 1980b).

The information presented in the preceding section as well as in the overview of women's contribution to agricultural production contained in chapter 2 indicates that women are significant contributors to the fulfillment of their family basic needs requirements. Men are more inclined to purchase consumer goods and luxury items, whereas women provide for the daily maintenance of their families (ICRW, 1980b and Bulter, 1979).

This pattern of responsibility distribution would imply that a family would rely more heavily on the activities of women. Guyer notes

from her study on West Africa that:

> Women's incomes in rural areas of West Africa are generally much less seasonal than men's. Women earn small amounts at regular intervals, and therefore tend to be responsible for the small, regular purchases. Consequently, the daily level of nutrition and standard of living may depend more heavily on the women's than the men's income (Guyer, 1980:6)

Among the Chewa of Malawi, women provide the family's food or crops for barter. When women's crops fail, there is inclined to be a shortage of food and bartering goods (Butler, 1979:9). A FAO study on Africa found that men's earnings from cash crops are not necessarily applied to basic needs with the exception of education, medicine and infrequent livestock purchases. Women's marketing activities, on the other hand, are spent on basic household items (UNFAO, 1988:113-118).

There is an increasing amount of literature that suggests that women's incremental income is more likely than men's to be spent on items which directly contribute to the welfare of children. A study of rural Kerala, India revealed that incremental maternal wages are significantly correlated with the nutritional status of children, whereas increments in paternal wages were not (Youssef, 1980:25). A survey undertaken in Colombia found that the rate of malnutrition among children of part-time working mothers (52%) was higher than the rate among children of full-time working mothers (32%). Similarly, the protein/calorie intake of children from low income families in the Philippines was lower for families where women do not work than for those where they did (Youssef, 1980:25). A study by Thailand's National Council found that the family's food consumption was positively correlated with women's income but not with the incomes of men (ICRW, 1980a:6). Finally, women in the Cameroon are expected to increase their

percentage share of expenditures on children's maturation as their individual incomes rise (Henn, 1983:1049).

In Tanzania, men use their cash crop earnings for "their own personal use and acquiring more wives" leaving women with the full responsibility of providing food for the family (Anandajayasekeram, et al, 1981:70). Women are obligated to supply labor for their husbands cash crop production, for which they receive little or no cash benefits themselves. Therefore, an expansion in cash crops and the consequent increases in their husbands' income will not necessarily lead to increases in the family's consumption or well being. In fact, the overall welfare of the family may decline if the demands for women's labor in cash crop production restrict their ability to cultivate their own subsistence plots.

Other studies indicate that men spend there incomes on consumer goods, alcoholic beverages and entertainment instead of on household needs of family. One study of male migratory labor in Kenya found that men spent their incomes on clothes, daily subsistence, drinks and women (Nelson, 1979:60). Mexican men have been found to spend their salaries on consumer goods, radios and alcohol, and Indian men working on tea plantations spend it drinking (Nelson, 1979:61).

These observations have important implications for policy prescription. Since it is primarily women who are responsible for the daily maintenance of the family and for the small regular purchases, it appears that changes in women's incomes would have greater short-run effects on the welfare of the family than men's income. Changes in men's income, which is primarily used for large, irregular purchases, would be more inclined to have long-run effects on the family's welfare.

3.3.4 The Decision-Maker As A Unit of Study

Given that the standard household and head of household concepts are too restrictive and inaccurately portray the socio-economic environment of a significant portion of the target populations of developing areas, it seems logical to suggest that alternative units of study be devised. Although residences are often convenient points of reference for research and program implementation, the common automatic assumption of consonant consumption, production, resident and budgetary boundaries should be avoided. Instead, the specific objectives and data requirements of the research project or development program ought to characterize a unique unit of study. Depending on the objectives of the study or program, e.g. enhancement of cash or food yields, improved nutrition or adoption of new technologies, individuals responsible for activities relevant to the objectives could be targeted. It would be crucial to determine who makes decisions, and therefore controls the processes under consideration. The procedure suggested here is to select the decision-maker as the unit of study.

Throughout most of the Third World, it is possible to find women managing subsistence agriculture. In India, the fields set aside for subsistence crops are largely controlled by women (Bagchi, 1982:23). Under the latifundio system in Latin American, women frequently have the responsibility of maintaining the minifundio (subsistence agriculture). Hausa women manage their own corn and rice fields (Cloud, 1977:6), and in the Gambia women and men have traditionally had control over the cultivation of separate crops (Dey, 1981:112).

The figures concerning the number of female managers and self

employed laborers for Africa are impressive:

> At least one third of the farm managers in Eastern and Southern Africa are women. 34% of agricultural employers and self-employed workers in Mozambique are women. This proportion is 54% in Ghana (UNFAO, 1979:10).

Moock and Staudt found, through two separate studies conducted in the same administrative district of Kenya, that women managed 38% and 40% of the total number of farms respectively (Blumberg, 1981:48).

Women also manage cash crop production. One-third ot th farm managers of Sub-Saharan Africa are women (Tinker, 1981:60). Ghanaian women own and operate both food crop and cocoa farms (UNFAO, 1979:10). Statistics for female managed farms in Tanzania and Chana are 54% and 41% respectively (Rogers, 1980:60). A study of Malawi found that women cultivate nearly every type of crop grown in these areas including cotton and tobacco, which require skilled spraying, harvesting and grading techniques (Butler, 1979:9).

After reviewing the literature on women's contribution to agricultural decision-making, several patterns begin to emerge. Men customarily control or dominate decisions concerning plough rentals and hiring labor, large cash outlays for land and equipment acquisition, major innovations in farm technology, and livestock purchase and sale, especially large animals such as cattle and camels. Less frequently, men will control grain crop disposal and the actual purchase of inputs. With the exception of Southeast Asia, men tend to dominate decisions, concerning cash flows, and in particular large cash outflows.

Women, on the other hand, make all, or most, of the decisions concerning cultural practices (production techniques). Generally, they are fully responsible for all decisions regarding their own subsistence plots. Women tend to control decisions concerning livestock maintenance,

planting, input use, and seed selection. The storage, processing and preparation of food as well as the allocation of harvest among livestock, sale and household consumption are determined by women. In addition, they make decisions regarding vegetable and legume production in home gardens and harvesting of wild vegetation such as boabob leaves and kerite nuts. Women also make decisions concerning small purchases such seed, inexpensive implements, food and household items. Less frequently, women manage hired labor, contribute to contracting decisions. They jointly (with their husbands) determine what crops will be grown and to whom they will be sold.

An FAO study covering seven Sub-Saharan countries revealed that women make decisions about feeding, milking and the health of milch animals while men purchase and sell them (UNFAO, 1977:115). Food storage, processing, preparation and distribution were also determined by women. The same study showed that while 89% of the West Nigerian women sampled participated in farm operations, few had participated in decisions concerning crop and livestock innovations (UNFAO, 1977:112). Although Kenyan men are traditionally responsible for land purchases, women decide how it and other agricultural resources are to be used (Berger, et al, 1984:8) In Tanzania, women were found to be fully responsible for livestock maintenance, decided what crops would be grown (Anandajayasekeram, et al, 1981:68) and how much fertilizer should be applied (Berger, et al, 1984:8).

Women of Bolivia, Peru and Eastern Cameroon were all found to participate in decisions regarding planting and seed selection (Ahmed, 1978:14; Deere, 1982:807 and Atayi and Knipscheer, 1980:65). In India, women play an important role in decisions about adoption of improved

women play an important role in decisions about adoption of improved seed varieties, fertilizers and new implements (Nelson, 1979:59). One study of Botswana revealed that women independently decide the time of plowing and type of seed to be planted in 31% and 57% of all cases respectively, and jointly decide with their husbands in 13% and 20% of the cases (Berger, et al, 1984:7).

Women of the commercial agricultural areas in Zimbabwe frequently manage farms and clock hired labor with the use of a radio (Cheater, 1981:357). Among sedentary farms of West Africa, women independently manage home gardens and control decisions regarding the sale of surplus vegetables and legumes grown from these gardens (Cloud, 1977).

The data in Table 8, compiled from a study of the Mwea and Nembure districts of Kenya, illustrate the distribution between spouses of

Table 8

Women's Participation in Household Decision-Making

Type of Decision	% Taken by Woman	
	Mwea	Nembure
General Decisions		
Family budget planning	20	40
Spending of money	15	35
Schooling of children	10	20
Household Decisions		
What to eat	98	100
Taking of maize to the mill	80	90
Purchase of firewood	20	90
What Food to Buy	64	80
Household replacements	60	70
Farm Decisions		
When to plant	60	75
What food crops to grow	60	70
Whether to buy seed	55	60
Whether to buy fertilizer	20	25

Source: UNFAO. (1979a)."Women in Food Production, Food Handling and Nutrition With Special Emphasis on Africa." Rome, FAO, Protein-

decision-making discussed above. Household decisions are overwhelmingly controlled by women, with the exception of firewood purchases in Mwea. The person primarily in charge of crop selection, planting times and seed purchase (not seed selection) is the woman. Men, on the other hand, dominate decisions concerning spending and budget planning.

A summary of the material on distribution of decision-making responsibilities is presented in Table 9. The decision-making items listed have been extracted from Casley and Lury's "Checklist of Information on Crop Management Practices" (Casley adn Lury, 1982:96). The extent to which items are unclassified illustrates the dearth of information concerning the distribution of decision-making roles. Although, for many of these items it is possible to identify the sex of the individual who customarily executes the task, it has not been assumed that this individual also makes the respective decisions. Furthermore, it should be noted that this distribution of decision-making responsibilities reflects joint operations (husband and wife operations). Women usually control all decisions related to their independent subsistence plots.

There are a number of factors that have been observed to influence both the absolute and relative participation of women in decision-making. Perhaps the most common observation is that women's participation in decision-making is directly proportional to their contribution to production. Indian women's significant involvement in decisions concerning fertilizer, seed and credit is attributed to their active participation in field activities (Bagchi, 1982:20). In Botswana, there is positive correlation between decision-making and the individuals contributing to agricultural production (UNFAO, 1977:112).

Table 9

Summary Table:
Sexual Division of
Decision-Making Responsibilities*

Decision Item	Men	Women	Decision Item	Men	Women
Land preparation	1		Fertilizer	2	2
Sequence of operations	1		Type		
Timing of operation in relation to rain	1		Rate of application		
Equipment used	1		Number and Timing of applications		
Seasonal variation in methods	1		Equipment used		
Planting	2	1	Method of application		
Varieties planted	2	2	Pest Control	1	
Density and spacing			Method of control		
Density and spacing: intercropping			Timing of control		
Timing of planting in relation to rain	2	2	Irrigation		
Spread of planting dates	2	2	Method of irrigation		
Sequence of inter-planting crops			Frequency		
Methods of planting			Harvest	2	2
Methods of covering seed			Time in relation to maturity		
Practices for replanting		1	Methods of harvesting		
Thinning		1	Use of leaves and tops for animals		1
Timing			Disposal of produce		1
Target density			Use of stocks		1
Use of thinnings			Post-harvest		1
Weeding		1	Method of threshing		1
Number of weedings			Timing of threshing		1
Timing in relation to planting			Timing and method of picking leaves & tops		1
Equipment used			Use of crops in food		1
Use of herbicides	1		Seed selection		1
Use of weeds			Time of selection		1
			Criteria of selection		1
			Seed production and storage		1
			Seed treatment		

* 1 = primary or controlling decision-maker
2 = secondary or contributing decision-maker. Used also for equal contributions from men and women.

Note: This more appropriately reflects joint production units than women's independent subsistence production.

Source: List from Casley, D.J. and D.A. Lury. (1982). Monitoring and Evaluation of Agriculture and Rural Development Projects. Baltimore, Johns Hopkins University Press:96). Information concerning decision-making is from the text.

> The increased obligation of women to contribute to family purchases and production of basic needs gives the woman more freedom and right to decision-making (Caughman, 1981:7).

Deere found for that for women of Cajamarca, Peru their contribution to decision-making increased relative to men as their participation in production activities increased (Deere, 1982:807 and Deere, 1983).

The participation of women in agricultural production is generally inversely related to family income (particularly in Latin America and Asia), and directly related to women's involvment in decision-making. A woman's responsibilities and contributions to income and her role in decision-making increases as the family or husband's income declines. For rural agricultural populations, landholdings are a common alternative measure of family income or wealth. In India and Indonesia, women's responsibilities are inversely related to farm size (Youssef, 1980:25). Another study in India revealed that women become less involved in decision-making as landholdings and the use of equipment and pesticides increases (Bagchi, 1982:23).

Both ownership and access to strategic production resources also provides women greater authority and the autonomy to undertake her own production activities. Galdwin suggests, based on her review of project effects on women, that development projects often redirect resources to men, reducing the control of women (Gladwin and Almy, 1984:1). Dey's study of the Gambia, mentioned earlier, is a good example of this effect (Dey, 1981). Abbott's study of Kenyan women (Abbott, 1976) and Oppong's study of Ghanaian women found that control of financial resources confers decision-making power to women. Other scholars have observed that women manage cash crops as well as subsistence crops when inputs, information and credit are available (Safilos-Rothschild, 1981:12).

Other factors which influence women's decision-making roles are those that also contribute to the incidence of female headed households: "nontraditional" mating patterns, migration and polygyny. In the cases of migration and polygyny, women will frequently manage cash crop fields for their husbands in addition to tending their own subsistence crops. In the cases of Lesotho, Malawi and Kenya wives, take full responibility for their husbands' cash crop operations in their absence (UNFAO, 1977 and Staudt, 1982:2). Ghanaian and Nigerian women of polygynous marriages often mind the cocoa and other cash crop fields for their transitory husbands (Cheater, 1981:351).

The use of decision-makers as the units of study has important research and policy implications. For instance, if the policy objective is to improve the well being of rural households, it may be preferable to target income gains to women because increments in maternal incomes are found to contribute more to welfare gains than are paternal incomes. Increases in cash crop production and the consequent increases in total family income do not necessarily lead to short-term improvements in the family's welfare or the long-term fulfillment of the family's basic needs requirements. In fact, the welfare of the family may deteriorate if women have an obligation to supply labor to cash crop production.

To enhance food crop production, researchers and policy-makers must target women. The separation of household budgets, men's lack of knowledge concerning their wives independent production activities, and the disparity in access to production inputs, capital, credit, marketing institutions and information between the sexes all contribute to the need for researchers and policy agents to specifically communicate and work with women directly.

CHAPTER 4

SELECTED ISSUES IN IMPLEMENTATION

4.1 Introduction

This section of the paper will trace the ramifications of the weaknesses in standard practices disclosed in the preceding chapter, and provide recommendations for improvements in research methods and program design. The chapter will attempt to complement the previous discussion of conceptual issues. Improvements in data collection techniques are suggested which, if implemented, could ameliorate the quality of data bases and background material developed from such procedures. Factors that have repeatedly contributed to project failure and/or reduced levels of project achievement will be identified. The factors discussed will be restricted to those stemming from the inconsistencies between the conceptual issues of the previous section and those incorporated in the case study program designs.

4.2 Data Collection: Suggestions to Improve Methods

4.2.1 Introduction

Women's production activities are frequently overlooked by survey teams. The fields they cultivate are less visible than those cultivated by men. Women generally cultivate crops either on distant, marginal lands or in home gardens and smaller plots adjacent to their residences. In the latter case, it is difficult to distinguish between housework and farm work because of the proximity of homegardens. In addition, horticultural production in home gardens is extremely land intensive, occupying small, easily overlooked plots with high yields per land unit

cultivated (Blumberg, 1981:71).

Women are more apt to work in kin-groups than men. Within these groups, there is limited recognition of the individual's specific contribution. Women are also frequently considered extensions of their menfolk. Men are listed as the farmer, cooperative member or sharecropper and women are simply part of the collective "family labor."

Other factors contributing to enumerators oversight of women's work as well. For various reasons, women's work is frequently considered unimportant, and is therefore overlooked. The enumerator's cultural or class prejudices influence his/her perception of the study population. Cultural norms also dictate whether or not it is socially expected or degrading for women to work and in what kinds or activities. Women as well as other family members, in response to these cultural expectations, will often devalue or de-emphasize their production activities and inflate those of male household members.

Data collection procedures can have profound effects on the quality of data and the extent to which women and their contribution to production will be included in the data set. Surveys, for example, have been found to include a greater portion of the working female population than censuses do. This discrepency in the data is due, in part, to the broader definitions and longer time periods used with survey methods. A survey of rural Bolivia indicated that female activity rates were between 20 and 39%, twice as high as those recorded by the census (Youssef, 1980:27). Similarly, a survey of the state of Sao Paulo in Brazil reported that there were four times as many working women between the ages of 20 and 44, and twice as many between the ages of 45 and 64 than the census had recorded (Youssef, 1980:27). In Honduras, an

interview with coffee and tobacco plantation employers revealed that 10,000 of their employees were women whereas the census had counted only 600 (Buvinic and Sebstad, 1980:38).

Time-use studies have been suggested as an alternative method of extracting information about home production and women's work activities (Birdsall, 1983). Time-use data can clarify the extent of individual household member's employment. Seasonal work patterns are recognized, the opportunity costs of specific activities are elicited (e.g. whether leisure or an alternative production activity is traded off), and the dynamics of interhousehold task sharing and distribution can be observed.

Unfortunately, the problems with time-use studies often inhibit their use (Anker, 1983:717). They are difficult to administer, requiring greater supervision and more highly trained enumerators and data processors. They require more time and money to both collect and process the data. Lastly, all these problems contribute to limiting the sample size, which may restrict the use of sophisticated statistical techniques.

In lieu of these problems with time-use studies, the following sections will concentrate on suggestions pertaining to improvements in interview methods and the content of the interview guides. By and large, these suggestions could be applied to present standard survey procedures without much additional cost in terms of time and money.

4.2.2 Interviewing Methods

The term "interviewing methods" pertains to the design of the interview in contrast to the term "data collection methods," which refers to the collection procedure followed, e.g. coat route, direct

measurement, participant observer, etc. Presented below is a partial list or set of guidelines for extracting data that is more likely to include important information concerning subsistence production, home production and women's contribution to the family's welfare.

Interviewing Methods Suggestions

1. It is best to use the concept of household only as a geographic location in order to keep track of sample participants.

2. If the household is used as the unit of, it should be representative of the objectives of the study, and the socio-economic structure of both the sample and extrapolated population. (see chapter 3).

3. The decision-maker approach to collection of information is the preferred method. (see section 3.3.4).
   a) The decision-maker identification is dependent on the objectives of the study, e.g. a consumption, production or budgetary study.
   b) Standard, unclear or general definitions of the head of household should be avoided.

4. Avoid sampling frames that systematically exclude members of the study population, e.g. tax lists and registers of cooperatives and marketing boards (Norman, 1973:7).

5. Do not use proxy respondents. Interview individuals who actually perform specific tasks. Decision-makers and workers need not be same individual.
   a) Do not rely on male representatives.
   b) Do not rely on "heads of households."
   c) Ask women directly.

6. Include all women and not just wives.

7. Use female interviewers with female respondents. If male interviewers are used, have the interviewer first speak to the man (if one is present), and then request to direct specific questions to the women/woman (Moris, 1970:15).

8. Include children 10-15 years old.

9. Ask questions privately when possible.

10. Do not assign arbitrary weights, i.e. conversion factors, for labor inputs.

11. Pick interviewers who have limited preconceptions and/or class or cultural biases.

12. Collect price and labor information concerning the following twice weekly (Dillion and Hardaker, 1980:23) or daily (Norman, 1973:41) if cost effective:
    a) commercial crop and livestock production,
    b) home production,
    c) off-farm employment.

Sampling frames which systematically exclude members of the study population should be avoided. Tax lists and registers of cooperatives and marketing boards frequently exclude subsistence producers and women. In Tanzania, women and marginal farmers are almost always not covered in these lists (Moris, 1970:9). Potential sampling frames that have used the standard concepts of the household and household heads should be avoided or adjusted for this bias.

Individuals who actually perform specific tasks should be interviewed. The individual has more knowledge of the activity and better recall than a proxy respondent. In addition, s(he) may have reasons for hiding information from other members of the household. Norman observed of the Hausa of Nigeria that:

> ...the household head does not know the income earning activities of women in the household as any such money earned is often kept by them. For example, when preparing cooked foods for sale, women often by the raw materials from the household head, prepare the food and get children to sell it outside the compound. Time spent by women on these activities and on shelling and threshing the crops is also unlikely to be known by the household head (Norman, 1973:27-28).

In addition, the respondent may have completely different perceptions of the producers constraints. For instance, women's greatest constraint is time. Therefore, women tend to be more interested in technology or cultural practices that increase yields per labor hour rather than yields per hectare. Women may place a higher priority on adopting labor-saving technology for harvesting and processing than men who may prefer new labor-saving technology for the land clearing stage of production,

i.e. draught animals or ploughs (UNFAO, 1977:135).

Frequently, proxy respondents provide inaccurate information intentionally or unintentionally. Dey discovered, through her interviews with men in the rice cultivating areas of the Gambia, that they denied that women owned or had access to the rice lands (Deyy, 1981:116). Anker observed that:

> ...male respondents are more likely than female respond respondents to underestimate the labour force activity of female household members (Anker, 1983:710).

When Syrian men were asked if their wives worked, the majority answered "no." However, when asked: "...if your wife did not assist you in your work, would you be forced to find a replacement for her?", they overwhelmingly replied "yes" (Youssef, 1980:27).

4.1.3 Interview Content

This section deals primarily with the composition of questions within the interview guide. The length of the interview as well as the order of questions can have pronounced effects on the respondent (Casley and Lury, 1981), but they are felt to have only a minimal, if any, influence on eliciting information about home production and women's work. Therefore, the suggestions focus on the composition of clear, culturally neutral and unambiguous questions. In addition, some suggestions are included to promote the development of more flexible interview guides, which are suitable across disparate samples.

Interview Question Suggestions

1. Use a clear and concise definition of farmer. Clarify whether farmer refers to or collect data which distinguishes between:
   a) producer,
   b) production manager,
   c) household head.

2. Do not use terms such as "chief earner" or "primary provider"

(or their local equivalents) in isolation.

3. Use the phrase "make a living" (referring to all production) instead of "earn a living" (referring to cash income).

4. Use a clear and concise definition of work and job. Or, Include all activities and than label each as remunerated or not.
   a) Work should include all activities contributing to family or individual welfare.
   b) Job should refer to market activities only.

5. Use a long reference period when establishing the occupational status of respondents, e.g. full-time, part-time, unemployed.

6. Include both primary and secondary activities.

7. Probe respondents for additional activities, e.g. use "key words" or "filter questions" (Anker, 1983:716).

8. Allow the respondent to give multiple task responses for a given time period, e.g. simultaneous performance of child care and handicrafts activitied.

9. When individuals are identifies as responsible for a given task specify extent of contribution: hrs/day, days/wk, days/yr or yrs/life-time.

10. To include intermittent work activities, use a low minimum boundary of continuous time worked to qualify activities as work units (Dixon, 1982:561).

Identifying definitions that are clear and concise for work, job, etc. is an important consideration in designing interview questions because the classifications of these activities are in part culturally determined. Deere found that Andean women would often classify their work as housework even when they engaged in income generating activities (Deere, 1982:799). Chilean women have listed planting and harvesting as housework instead of as agricultural work (Dixon, 1982:544). The misclassification of women's work is often the result of the cultural perception that family status is adversely effected by female members work activities, especially if they work for a non-family member. Under such circumstances, both male and female respondents are apt to

understate the contribution of female family members. Furthermore, Anker noted that Kenyans defined jobs as wage or salaried activities while work was "...considered to include time-consuming activities required for family survival" (Anker, 1983:712).

Inclusion of secondary activities significantly alters the participation rates of women. In India, the participation grew from 26% to 49% when the 1961 census included secondary occupations (Beneria, 1981:13). The rate than decreased from 23% to 13% in 1971 when census reverted back to using primary occupations only (Dixon, 1982:539). The participation rates of Andean and Sudanian women changed from 3% to 21% and from 10% to 40% respectively when secondary activities were accounted for (Beneria, 1981:15). Concluding from these observations, changes in the participation rate of women are due largely to changes in accounting methods. Deere contends:

> ...that the low female agricultural participation rates are due to faulty conceptual categories for measuring women's agricultural participation" (Deere, 182:798).

It should be acknowledged that the secondary occupation of one individual may contribute more to total family income (both market and non-market) than the income of the primary cash earner. In fact, a woman who considers herself primarily a housewife and only secondarily a marketwomen, may earn more cash income than her spouse who considers himself primarily as a laborer, even if he works irregularly.

Women's work is charactertistically more intermittent than men's work. Classifying activities as work according to low minimum work time boundaries increases the chances of including women's production

(Rogers, 1980:164). Also allowing women to list multiple tasks for a specific period of time identifies an array of productive activities, e.g. watching children and making rugs, jewelry, cloth, or other handicrafts. Women also combine leisure time chatting with other women and handicraft production, e.g. hand spinning yarn by Bolivian women.

4.3 Extension in Sub-Saharan Africa

4.3.1 Introduction

A recent trend in development planning has been to redirect the emphasis of development schemes toward smallholders and/or semisubsistence farmers and away from large-scale commercial agriculture and the economically progressive farmer. The previous bias toward large and/or progressive commercial farmers had only augmented the pre-existing inequalities among rural producers without contributing any perceptible improvements for the majority of the rural poor. The outcome of such a bias poses not only serious equity problems but also imposes restrictions on fulfillment of food security objectives.

Suggested as part of the World Bank's Agenda for Action are: 1) changing the focus of agricultural sector planning of Sub-Saharan Africa to smallholders, and 2) altering incentive structures (e.g. of inputs and product prices) as well as increasing farmers participation in decisions which effect them (World Bank, 1981:50). According to the World Bank, this focus is necessitated by several agro-economic factors specific to Sub-Saharan Africa. First, while the smallholder sector produces the bulk of the agricultural output, achievement of the sector's full potential is severely restricted by the limited specialization and use of off-farm inputs as well as low and often stagnant yields. Second, poverty in Africa is largely located in the

rural areas. And third, efforts directed specifically at smallholders are believed to be the most cost-effective methods of increasing agricultural production (World Bank, 1981:50).

One common, if not central, component of development programs for smallholders is extension. It is a means by which information concerning new technologies and agricultural practices is disseminated among the rural population. Uma Lele and Wilfred Candler, in an article concerning alternatives to the faulted public distribution of food supplies in East Africa, suggested that:

> Rural food security will be achieved through increased research and extension on the production of drought-resistant crops, improved input supply, produce marketing, an improved communication network and effective farm household storage program (Lele and Chandler, 1981:118).

While extension is potentially a powerful development tool, its effectiveness depends partly on whether the information is appropriate for the target population. One element that defines the appropriateness of information is the educational level of the recipient. Education and literacy influence the recipient's ability to understand and implement specific recommendations and gain admittance to training programs. Mellor views education as a critical component of rural agricultural output augmentation schemes particularly where new high-yielding varieties, chemical fertilizer and pesticides, irrigation and other technically sophisticated inputs and/or cultural practices are employed. He states that:

> Failure to expand education to upgrade its technical content and to furnish in-service training will provide a major constraint to rural development...(Mellor, 1976:75).

According to T.W. Schultz, education is a particularly important

ingredient to production under modernizing conditions:

> The adoption and efficient cultivation and harvesting of sugar cane appears not to depend upon the level of schooling of those who do the field work. Nor do the capabilities associated with schooling have any economic value in hoeing cotton. But to grow rice or corn or to undertake dairying, using modern agricultural inputs appears to be quite another story...where technically superior factors of production are a principal source of agricultural growth, schooling counts (Schultz, 1976:187-189).

Table 10 includes a list of education requirements for sufficient comprehension of different levels of technological complexity that correspond to four stages in agricultural development. It should be stressed that the effects of education and extension appreciate when the selected recipients are the individuals who actually perform the tasks to be modified or directly utilize the new inputs and technology.

4.3.2 Relevance of Female-Farmers to Extension Efforts

Given the above role of extension and the information contained in the previous sections, it seems logical to assume that women are appropriate direct recipients of extension and education efforts. For all the regions of Sub-Saharan Africa listed in Table 1, women contribute upwards of 34%, and in some cases above 70%, of the total agricultural labor inputs. Land clearing, turning the soil, tree-crop trimming and hunting are the only activities for which women provide less than 50% of the labor (see Table 2). Furthermore, the material in Table 7 indicates that a significant number of Sub-Saharan households are directed by women, while that of Tables 8 and 9 reveal the extent of decision-making responsibilities delegated to women.

Because of women's tremendous contribution to agricultural production in Sub-Saharan Africa and the importance of food crop

Table 10

Educational Requirements For
Various Levels of Technological Complexity

Technology level	Agricultural inputs	Minimum educational requirement
Level 1 traditional farming	local varieties of seeds and implements	addition and subtraction
Level 2 intermediate technology	small quantities of fertilizer	addition, subtraction, division and rudimentary literacy
Level 3 fully improved technolgy	high-yielding varieties; proven seed: seed rates/acre; fertilizer rates/acre; and pest control rates/acre	multiplication, long division, and other complex math; reading and writing facilities and rudimentary knowledge of chemistry and biology
Level 4 full irrigation-based farming	all of the above; tube-well access during the off-season; and water rates/acre.	math, high reading comprehension, written communication, ability to research unfamiliar words and concepts; elementary chemistry, biology, physics; and regular access to information from print and electronic sources

Source: Heyneman, Stephan P. (1983). "Improving the Quality of Education In Developing Countries." Finance and Development 20(1):18-21.

production to food security objectives, female-farmers must be addressed as distinct economic agents and not merely as members of a household or subsumed in family labor. It is necessary to study how women think, make decisions and respond to various incentives.

Separating female-farmers from their menfolk establishes new divisions of endogenous and exogenous variables, and sheds light on intrahousehold relationships as well as various economic and social institutions' influences over the production system. For example, Hausa women prefer goats and sheep as livestock investments because, under religious seclusion, children can herd small livestock and they are removable upon divorce (Guyer, 1980:5). Similarly, Niger women refused to plant fruit trees and preferred to invest in livestock over field crops because the men owned these crops while the women were permitted to own livestock. In addition, Niger women initiated the adoption of planting tools used by men since the implements also contributed to increased yields on women's small food crop plots (Ashby, 1981:167).

Finally, due to socio-economic institutions, men and women have different access to labor, a scarce factor in rural Sub-Saharan Africa. Men may hire both men and women, and they have priority over family labor. Women, on the other hand, have to rely on work exchange with other women, which increases their work obligations, and they must first fulfill labor requirements for their husbands' fields prior to those of their own fields (Atayi and Knipscheer, 1980 and Guyer, 1984). The fact that men and women have both different work obligations and access to labor and other resources contributes to the development of sex specific perferences for new technologies and cultural practices. Technical packages of extension programs need to reflect these differentiated

prefences.

4.3.3 The General State of Education and Extension Efforts for Women

During the 1970's, the illiteracy rate for African women was 83.7% (UNDP, 1980:55). There is, however, a wide variation among countries: women in Burkina Faso, Mali, Niger and Senegal have literacy rates under 1%; figures for Ghana, Swaziland, Uganda and Zambia range from 18% to 34%; in and Botswana, Lesotho and Reunion women's literacy rates exceed those of their male counterparts (Africa Report, 1981:65).

Females' access to education is generally more restricted than males. Adherence to Purdah once girls reach puberty, social norms concerning marriage and pregnancy, and the lack of female teachers and adequate facilities all prevent females' attendance in school. As mentioned in section 2.2.8, overburdened mothers prefer that girls assist them with their daily activities. Furthermore, parents are reluctant to pay admittance fees for girls if they are expected to either move from the family under a virilocal marriage system or take on similar responsibilities that their mothers had, who did not require formal education themselves (UNDP, 1980). All these factors constrain female farmers' attainment of new knowledge. It is therefore crucial that extension organizations attempt to compensate for this impediment.

In Africa, extension systems are nearly completely sex-segregated (Carr, 1980:7). Under such a system, low quality, token programs are provided for women (Carr, 1980; Rogers, 1980; Berger, et al, 1984; Butler, 1979; Ashaby, 1981; Lele, 1975; Ghai, et al, 1979 and others cited in the following sections on extension). Only 3% of the agricultural extension personnel in Africa are women (Berger, et al, 1984:58). According to Uma Lele:

> ...the goal of extension services has frequently been not the increase in farm-level productivity of women but rather finding ways to reduce their participation in agriculture through promotion of more homebound activities (Lele, 1975:77).

The data in Table 11 illustrate this sexual division in training between domestic (women) and other production (men). It is interesting to note that while only 15% of agriculture and 20% of animal husbandry training

Table 11

Access to Non-Formal Education by Sex in Africa

Area of Activity	Units of Participation*	
	Men	Women
Agriculture	85	15
Animal Husbandry	80	20
Cooperatives	90	10
Arts and Crafts	50	50
Nutrition	10	90
Home Economics	0	100

* units of participation are defined such that a 50/50 division would imply equal access between the sexes.
Source: ECA's Women's Programme cited in (Carr, Marilyn. (1980). "Technology and Rural Women in Africa." Geneva, ILO, World Employment Program Research Working Papers.8).

is available to women, data in Table 2 indicates that women undertake 60-80% of all agricultural work and 50% of the animal husbandry. Table 12 provides data on the number and percent of male and female extension agents in selected African countries.

Some researchers suggest that the combination of the bias of institutions toward commercial over subsistence agricultural activities and the sexual division of production spheres between commercial (male) and subsistence (female) contributes to the disproportionate share of extension and non-formal educational training available to men (Tinker, 1981:65). However, referring back to sections 2.1.3 and 2.2.7, women still provide the bulk of the labor inputs to commercial agriculture;

Table 12

Sexual Composition of Extension Personnel in African Agricultural Programs

Country	Agriculture		Home Economics*		Other		Total				
	male	fem.	male	fem.	male	fem.	male	fem.	both	%m	%f
Botswana	186	13	-	2	178	9	364	24	388	94	6
Gabon	80	-	-	-	11	2	91	2	93	98	2
Gambia	170	6	-	-	457	9	627	15	642	98	2
Mauritius	56	-	-	-	18	2	74	2	76	97	3
Nambia	11	4	-	-	8	-	19	4	23	83	17
Nigeria	1106	104	-	-	680	9	1789	113	1899	94	6
Senegal	1088	3	-	1	71	-	1159	4	1163	99	1
Seychelles	11	3	-	-	3	1	14	4	18	78	22
South Africa	1107	-	-	2	563	-	1670	2	1672	99	1
Togo	-	-	-	-	212	-	212	-	212	100	0
Tunisia	-	-	-	-	12	3	12	3	15	80	20
Zimbabwe	1682	23	-	-	551	72	2233	95	2328	94	6

* Data only includes home economics extensionists who work under agricultural programs.
Source: Adapted from Swanson, Burton and Jaffar Rassi. (1981). International Directory of National Extension Systems. Urbana, University of Illinois, Bureau of Educational Research. Cited in Berger, Marguerite; Virginia Delancey and Amy Meilencamp. (1984). "Bridging the Gender Gap in Agricultural Extension." Washington, D.C., International Center for Research on Women.

they also own and manage cash crop enterprises (see Table 1 and section 3.3.5) and contribute to a variety of decision-making categories (Tables 8 and 9). Therefore, extension efforts aimed at either cash or subsistence crop production ought to include female clients as well as.

Other explanations of why female-farmers are often overlooked or are ignored by the extension services are as follows. Subsistence plots as well as poor, marginal farms of women with absentee husbands are either less visible or ignored under "progressive farmer" programs. Also, women's low status and limited access to land, inputs, cash and education all inhibit their inclusion in extension programs, especially progressive farmer programs. Social norms often prohibit male/female interaction. Male agents prefer to deal with men and it is often assumed

that women will receive the information they need through their husbands and other menfolk (Ashby, 1981:158).

Finally, it was incorrectly assumed that the structure of African farms and the needs of African farmers were similar, and in many ways indentical, to those of the United States. Consequently, the U.S. model of extension, based on sex-segrated training (i.e. males receive technical advice and females receive home economics and nutrition training) has either been replicated or improvised throughout much of Africa.

4.3.4 Case Studies

A review of the literature concerning the ability of Sub-Saharan African extension agencies to transfer knowledge and impact upon the productivity of female-farmers discloses a dismal record. Although the literature is limited and often incomplete, some conclusions can be made. In general, the conceptualization of the semisubsistence farm used by extension agencies and training centers completely misrepresents reality. The structure and mechanisms of work distribution, responsibilities and decision-making within the system are either misunderstood, taken for granted or ignored.

Specific criticism can be generalized across most of Sub-Saharan Africa. Training centers, whether providing instructions for extension agents or farmer self-help programs, enroll predominantly male participants. Where programs exist for women, they are of low quality and cover topics such as home economics, nutrition, child care, and health, even though women are heavily involved in field and livestock activities. Extension agents are generally male, especially agricultural technicians, and they confer with male members of the household, whether

or not they undertake farming or performed specific tasks critical to the technologies solicited by agents. Female-farmers are not approached by male extension agents. It is generally assumed that men will pass all relevant information on to female producers. The following case studies are illustrative of these observations.

4.3.4.1 Ghana

The two most common innovations promoted by the Ghanaian national extension service and the FAO are hybrid maize and chemical fertilizer (Bukh, 1979:68). Female-farmers were reluctant to adopt these innovations because: 1) hybrid maize is essentially a cash crop while women were primarily concerned about food crop production, and 2) women lacked the capital required to purchase the expensive chemical fertilizers and no specific credit facilities were available to women. They were also reluctant to undertake cultivation of new varieties for which they lacked sufficient relevant knowledge.

The Ghanaian extension service is noted for its bias toward progressive male-farmers; visits are concentrated among 10% of the large cocoa farmers. In 1977, no women had yet been visited by an agent. (Bukh, 1979:70). In addition, the Ministry of Agriculture's Home Extension Unit was created specially for women but it only provided training in post harvest techniques such as food preservation, storage, processing, dry season gardening, home economics and nutrition (Bukh, 1979:71).

4.3.4.2 Malawi

Perhaps the most widely known development project in Malawi is the Lilongwe Land Development Program (LLDP). Two components of the project are the Extension and Evaluation Service and the Credit Administration.

These institutions relied on the Village Grower Register to identify appropriate clientele, however, the register incorporated many of the head of household biases discussed in section 3.3.2. The register assumed that the head of the household was also the grower and automatically assigned the title head of household to a male corporate head (Rogers, 1980:69).

Extension agents are to visit with one member of each household, preferably the head. This assumes that regardless of how sporadic a male's presence is in the project area, he is always responsible for planning and farm innovation. But, on the contrary, the data in Table 7 indicate that 75% of all Malawian households are run by de facto female heads. The high incidence of polygynous marriages resulted in the exclusion from the register of a large portion of the independent residences.

Another problem with the program conceptualization is that the content of training programs for men and women is inconsistent with the actual proportionate labor and decision-making inputs of men and women in the field. Men received technical assistance in agriculture production and animal husbandry, while women receive training in nutrition, home economics, needlecraft, child care and domestic skills (Rogers, 1980:89). One Farming Systems Research study revealed that while women performed most of the agricultural work related to on farm field trials, they were not present when recommendations were presented to their husbands. In addition, men do not generally transfer the new knowledge to the women (Gladwin and Almy, 1984:10). Consequently, fewer women than men knew the correct procedures. Many men simply forgot them.

In an attempt to reach female-farmers (growers), the Ministry of

Agriculture and Natural Resources undertook a program called "Training of Local Trainers" to train female field technicians. Unfortunately, the bulk of these courses also dealt with home economics, cooking, sewing and handicrafts (Butler, 1979:14 and Perraton, et al, 1983). In addition, women were expelled from the program if they became pregnant, inadequate dormitory facilities restricted their attendance and customary law prohibited women from wearing pants, which precluded them from operating tractors or motor driven equipment (Butler, 1979:14).

4.3.2.3 Tanzania

In the Arusha and Morogoro regions, the government of Tanzania has undertaken a National Maize Project (NMP) to provide subsidized inputs to maize producers (Safilios-Rothschild, 1981:7). The women of these regions are responsible for food crops, food storage and providing unpaid labor for the men's cash crops (Fortmann, 1981:191). Overall, 51% of the Tanzanian population working in agriculture are women and a large majority of these women are managers (Safilios-Rothschild, 1981:7). Nevertheless, only 8% of project participants were women, and only 20% of the these women were visited by an extension agent while 58% of the men were (Safilios-Rothschild, 1981:7; Fortman, 1982 and Fortmann, 1981:194). Furthermore, according to Mbilinyi, female respondents of a survey of the Farmer Training Scheme in Mbeya stated that they were rarely visited by the extension agents (Mbilinyi, 1982 cited in Berger, et al, 1984:11). Despite the unequal availability of information and inputs, participating female farmers did not significantly differ from male participants with respect to progressiveness, good maize practices and adoption of innovations (Safilios-Rothschild, 1981:7).

The Arusha Declaration of 1967 and the creation of Ujamaa Villages

purported to secure equal opportunities for men and women. Nevertheless, benefits received through participation in the villagization process reach few women; only a minority of women are Ujamaa members (Beneria, 1982:148). Moreover, the village programs provided by the Union of Women in Tanzania (UWT), with the exception of a few communal farms, focus on non-agricultural activities such as cooking, sewing, basket weaving and child care. Yet, women's major activities are to maintain home gardens, poultry and cultivation of their own plots (Ghai, et al, 1979:87). Referring to extension programs, proceedings from a conference on Farming Systems Research in Tanzania contained the following statement:

> As far as women are concerned, these almost entirely concentrate on nutrition and health matters as though these were the only problems that women in rural Tanzania address themselves to (Anandajayasekeram, et at, 1981:71).

4.3.4.4 Botswana

The Botswana Rural Training Centre is a primary source of agricultural instruction for both men and women. However, serious problems related to the delivery of information to women have been cited in a number of publications (UNFAO, 1977; Ashby, 1981; Bond, 1974 and D'Onofrio-Flores and Pfafflin, 1982). Although women performed 48-80% of all crop activities (see Table 1), men constituted nearly two-thirds of the participants in the training program. In addition, 100% of the trainees attending family welfare and home economics courses were women, while similar figures for farmer courses and agriculture in-service were only 32% and 0% respectively. Enrollment figures for men and women in the various courses offered by the center are shown in Table 13. An FAO evaluation study reported that as of 1976 there were still no female agricultural demonstrators (UNDP, 1977:124).

Table 13

Male and Female Enrollment In
Rural Training Courses in Botswana

Type of course	% of total course	% of participation	
		male	Female
farmer course	35	68	32
family welfare	9	0	100
home economics	9	0	100
co-ops	25	82	18
4-B (youth)	5	29	73
agriculture in-service	5	100	0
school teachers	4	85	15
other	6	32	68
Total	100	60	40

Source: Ashby, Jacqueline A. (1981). "New Models for Agricultural Research and Extension: The Need to Integrate Women." In Lewis, B., ed. (1981). Invisible Farmers: Women and the Crisis in Agriculture. Washington, D.C., AID, WID.

Related to the demonstrator training course weaknesses was the inadequate delivery of information by extension agents. Most agents were male, limiting their ability to contact female-farmers. Agents customarily contacted male heads of households although the material in Table 7 indicates that female headed households comprise 48%, and in some villages as many as 80%, of all households. Moreover, demonstrations and other meetings convened when women were working in the fields. Even when convenient times were arranged, most women still could not attend because adequate child care facilities were not provided (UNFAO, 1977:123).

The Ministry of Agriculture did provide one program during the 1974-77 period in which women and men were "trained in exactly the same courses and posted and assigned duties in the same manner" (Ashby, 1981:172). Evaluations of the female graduates concluded that they worked with farmers of both sexes, under the same conditions as men and the quality of their work was equal to that of their male counterparts.

Nevertheless, a limitation of this program was that it was small and of a short duration.

In 1977, A permanent women's unit within the Department of Agriculture Field Services in the Ministry of Agriculture was established (Bettles, 1980 cited in Berger, et al, 1984). The objectives of the unit are: 1) to increase women's participation in local farmer committees, 2) to provide training in home economics and agricultural production and 3) to supply purchasable seed for vegetable gardening. Unfortunately, there is insufficient data available to monitor the progress of the unit. A World Bank report noted, however, that technical advice appeared to be "diluted" by the inclusion of training and inputs associated with women's traditional household and family roles (World Bank, 1980).

Also recently undertaken, a USAID farming systems research (FSR) project had a primary objective of reaching small farmers of which 40% are women (Berger, et al, 1984:63). Although the project terminated in 1984 (a five year project spaning 1979 through 1984), no information concerning the results of the project are available.

4.3.4.5 Kenya

Most of the information reported here on Kenya's extension programs was extracted from Staudt's research on the western district of Kakamega, and Moock's comparative study of farmer efficiency in the same district (Moock, 1976). The major institutions reviewed by these studies were: the Farmer Training Center, the Agricultural Finance Corporation (AFC) and the Guaranteed Minimum Return program (GMR).

In Kenya, women contribute 80% of the subsistence agricultural work, provide 95% of the food supply in some villages and comprise 40%

of the farm managers in the Kakamega district (see Table 1). Women do digging related to land preparation, and they performed planting, weeding and harvesting activities (Staudt, 1982:208). Female-headed households account for between 31-40% of all households depending on the region in question (see Table 7). Staudt suggests that 36% of the Kakamega households are headed by women (Staudt, 1982:208). Among the crops promoted by the extension agency hybrid maize and "European" vegetables function both as major subsistence and cash crops (Staudt, 1982:4).

Over 98% of the agricultural staff of the extension agency are men. (D'Onofrio-Flores and Pfafflin, 1982:87). Of the women who are trained as instructors, many drop out of the extension services because of family conflicts over the travel demands of the job (Gladwin and Almy, 1984:8). Furthermore, two-thirds of the district and national level trainees are men, and the women attending these programs receive training mainly in cooking, child care, sewing, health, sanitation, nutrition, home management and vegetable gardening. Most of these women are the wives of chiefs, assistant chiefs and agricultural staff (Staudt, 1982:3).

In Kenya, social norms prohibit male instructors from speaking with female-farmers, especially when their husbands are absent (Staudt, 1982:3). Coupled with the overwhelming majority of male instructors, it is not surprising that so many farms managed by women remained unvisited, 49% as compared to 28% of jointly managed farms (see Table 14). One study observed that:

> The society is characterized by communication between men on governmental matters and by symbolic male authority over households, despite extensive male absence in rural areas (D'Onofrio-Flores and Pfafflin, 1981:87).

Table 14

Rates of Intoduction and Utilization
of Extension Information
by Farm Management Type in Kenya*

Item	female managed	jointly managed
A) Visits by instructor		
never visited	49% (42)	28% (36)
visited at least once	51% (43)	72% (91)
B) Visit by instructor, controlled for economic standing		
High:		
no visits	95% (80)	16% (09)
visited at least once	61% (22)	84% (49)
Low:		
no visits	57% (28)	39% (27)
visited at least once	43% (21)	61% (42)
C) Visits by instructor to early adoptors of hybrid maize		
never visited	31% (5)	3% (01)
visited at least once	69% (11)	97% (33)
D) Farmer training (2wks)		
no member attended	95% (80)	80% (102)
one or more member attended	5% (09)	20% (25)
E) Adoption Rate		
cash crops	1.5	1.5
food crops	1.9	2.0
F) Loan information aquisition		
knew nothing about loans	99% (83)	86% (109)
had applied	1% (01)	12% (15)
aquired a loan	-	2% (03)

* numbers in parentheses are the number of observation in that cell.
Source: Staudt, Kathleen. (1978). "Agricultural Productivity Gaps: A Case Study of Male Preference in Government Policy Implementation." Development and Change. 9:439-57 and Staudt, Kathleen. (1982). "Women Farmers and Inequalities in Agricultural Services." In Bay, Edna G., ed. (1982). Women and Work in Africa. Boulder, Westview Press, Inc.

Moreover, according to an agriculture personnel interviewed by Staudt, extension agents generally believe that the male head of the household, who they confer with, will pass the pertinent information onto other relevant members of the household, i.e. their wives (Staudt, 1982:11).

The extension agency is the main source of communication between the government and the rural population. Agents use "barazas," traditional gatherings of men, as convenient locations for instruction and demonstrations. Women, however, do not attend the barazas due to both time and cultural constraints (Staudt, 1982:208). The majority of women participate in communal and/or community groups, yet no instruction is provided through these groups (Staudt, 1978:451). The result is a reinforcement of the sex-segregation and female-farmer neglect of the extension system.

According to the figures in Table 14, fewer female managed farms than jointly managed farms had members attend two week training courses. Of the 20% of jointly managed farms with attending members, only 6 participants were females. In many cases, sons who were trained moved off the farm and found non-farm related employment (Staudt, 1982:7).

Kenya has a high rate of male-out migration from the rural areas. Moock found that with improvements in their education, men moved out of rural areas and into industry or urban employment, while women were inclined to remain in the rural areas, applying their additional education to agriculture (Moock, 1976:835). This may be due to the fact that women are traditionally full-time farmers over their entire life, whereas men seek outside employment while they are young and middle-aged; farming is only undertaken in old age (Staudt, 1982;7).

Moock suggested that this phenomenon results in a concentration of

less educated and perhaps less intelligent men in the rural areas. Therefore, selected recipients of extension services, the men, were possibly the least competent people in the villages (Moock, 1976:835). He concluded that the effect of education of women had a greater impact on output, in spite of their being relatively neglected.

Staudt found that a significant portion of the early adopters of hybrid corn were women (Staudt, 1982:11). Data on Table 14 illustrates that there is no significant difference in adoption rates between female and jointly managed farms. Yet, there is considerable disparity in the number of visits, knowledge of loans, applications for loans and actual loans acquired between farm type: joint farms score better in all cases. In sum:

> The research by Staudt and Moock on the bias of the extension service in Kenya against women farm managers, shows they are managing their meager resources as well or better than men, despite the discrimination against them (Uphoff, et al, 1979:126).

One final example of extension activities in Kenya is the system instituted in the Mwea and Nembura districts under the resettlement authority. Although Chambers and Moris briefly mention that women participate in farmer training and nutrition courses (7% and 24% of the women of Nembura and Mwea respectively), the only examples of their participation provided refer solely to pre-natal, post-natal and child care courses.

The designers of the program envisioned men as the heads of the households, the principle laborers and the decision-makers. yet, the data on Table 8 illustrates that women of Nembura and Mwea generally make the decisions concerning farm and household production. Men's major contributions to decision-making concern household purchases.

4.3.4.6 Burkina Faso

After enactment of the Percy Amendment by the United States Agency for International Development (AID) in 1976, the government of Burkina Faso was mandated to have revamp their extension program for women, providing more technical knowledge. In reality, however, the new program closely resembled the old home economics programs. "Agents d' Economie Familiale" (domestic economy agents) gave instructions to female-farmers concerning health, hygiene, sanitation, literacy and "unspecialized agricultural or economic activities (Rogers, 1980:90).

Of the 1,500 extension agents trained through the regional development organizations (ORD's), only 95 (about 6%) were women (Rogers, 1980:90). It should be recalled that in the settlements women performed 74% of all crop work (see Table 1). In addition, interviews with Burkinabe spokeswomen revealed that female-farmers' major immediate concerns were for access to wells (As indicated in Chapter two, in some areas of Burkina Faso it can take women as much as 5 hours to retrieve water), carts for transport, devices for grinding millet, and the amoun of work they had (Cloud, 1977 and Carr, 1980:10). None of these concerns are reflected in the content of the extension courses in home economics listed above.

4.3.4.7 Ethiopia

In 1975, the women's program of the Chilalo Agricultural Development Unit (CADU) was evaluated. The program was found to consist of originally mother and child care, sewing and vegetable garden activities. Later, courses in hygiene, gymnastics, nutrition and home improvements were added (UNFAO, 1977:144-45). Many women have also claimed that they are unable to attend other "progressive farmer"

programs, which deal with technical agriculture, because of time-constraints or their husbands' outright refusal to permit them (UNFAO, 1977:146).

4.3.4.8 Rwanda

Extension services for women address cooking, sewing, embroidery, child care and nutrition. The training center in Nyagahanga has a lower-quality program for women than for men, even though women play "a fundamental role in crop farming and animal husbandry" (UNFAO, 1980:89).

4.3.4.9 Zambia

The Zambian government does provide training for women as well as men, about 30% of the 1974 enrollements at one Farm Institute were women (Muntemba, 1982). Women's technical training, nonetheless, was significantly more limited than men's. Only three courses dealt with poultry, maize and groundnut production, while seven courses dealt with "female extension" such as sewing, kitting and advice on establishing sewing clubs. The government did support women's initiatives to create poultry cluds as well.

4.3.4.10 Niger

In Niger, female-farmers have expressed interest in improving their agricultural production skills throught their repeated requests for weeding tools, fungicides for millet seed, mills, improved water supply, animal traction and instruction in animal husbandry. At the time, there were no institutions for training women even through a long standing school for training male extension agents was enlarged during the 1970's (Cloud, 1977).

In 1981, USAID initiated a feive year progarm to construct seven new "Farmer Training Centers". Graduates were to act as village-level

demonstrators, and tow female "animatrices" (agents) were to be trained for each village. Little information is available concerning the women's component of the program, however, reports of th training centers suggest that while operating at full capacity, the centers' technical packages are inadequate and there is a lack of short-term credit and inputs (Berger, et al, 1984:65).

4.3.4.11 Chad

USAID established a two year (1978/79) training program for 200 female farm partners, i.e. women whose husbands were receiving training. The training course was comprised of 70% technical agriculture and 30% home economics, marketing, and literacy instructions. The results of this program are unknown.

4.3.4.12 Senegal

In a rice producing area of Senegal, Taiwanese field instructors were brought in to train farmers in improved rice cultivation practices. These techniques were demonstrated to men only, but women are the cultivators. The men took no notice and the women remained uninformed, and the program was a failure (UNDP, 1980:65).

In 1979, USAID initiated a five year program to "...improve extension and research capabilities to reach the entire farm family" (Berger, et al, 1984:63). The women's component of the project had the following objectives: 1) To provide agricultural inputs, 2) to install village grinding mills, 3) to assist in establishing women's producer cooperatives, 4) to train female village extension workers, 5) to test training materials for women in nutrition, health and home economics and 6) to disseminate labor-saving devices. No information concerning the degree of success of the project is available. One World Bank study,

however, remarked that the effectiveness of technical extension is impared by the inclusion of home economics training (Berger, et al, 1984:63).

An earlier USAID program (1976-78) focused specifically at farm women and girls. The program intended to establish cooperatives for vegetable production and marketing, to install wells and pumps for irrigation and to provide literacy, production, marketing and cooperative management training. By 1980, vegetable gardens were planted in only 7 of the 13 target villages, only 2 of the 26 pumps installed were operable, most of the wells had run dry, primarily men attended the literacy classes because the women and girls lacked time, yields were low, little or no profits accrued to vegetable production and the nutritional status of participants and their families did not improve (Berger, et al, 1984:64).

4.4 Neglected Factors Contributing to Program Underachievement: Other African Cases

This section provides a review of a number of programs which neglect or misrepresent crucial components of specific semisubsistence agricultural systems. Examples to be discussed here include programs which neglect to account for: 1) women's right to the use or ownership of land, 2) women's role as the provider of the family's food, 3) women's labor constraints, 4) women's independent need for credit and access to inputs, and 5) women's need for access to markets for their product. As with extension programs mentioned in the previous section, these design deficiencies influence the delivery of services and render some programs ineffective in achieving their objectives.

Certainly, not all development programs suffer from these

deficiencies. However, the fact that many do is significant in itself. This section will present examples of actual programs that fall into each category mentioned above, and attempt to illustrate the importance of incorporating a more complete and accurate conceptualization of the systems targeted by development programs.

4.4.1 Women's Rights to the Use or Ownership of Land

Generally, land reform and distribution have had negative effects on women's access to land and it's product. The establishment of "western" property rights has eliminated women's traditional usufruct rights, and the reallocation of land to male heads of households has severely restricted women's options for owning land. Colonial policies, land reform and resettlement schemes commonly distribute land to male household heads (Blumberg, 1981; Noronha and Letham, 1983 and UNDP, 1979).

Cloud noted that in the Sahel, resettlement schemes alter the form of property rights, assigning land to individual families. Because a single head of the household is identified for repayment purposes, ownership of land passes to this individual. Women, infrequently identified as the household head, lose their rights to the land and become dependent on the men (Cloud, 1977).

In Kenya (including the Mwea resettlement scheme), Nigeria, Lesotho, Togo and Ethiopia, modern laws have replaced female farmers' traditional right to the product of the land they cultivate and/or have reversed their more recent right to land ownership (Staudt, 1980 and UNDP, 1979). In the mid 1970s, only 5.9% of the land in Kenya was registered in a woman's name, and in Lesotho only men have legal right

to enter into land contracts although 85% of the agricultural labor force is female (Bennet, 1979 and Pala, 1976 both cited in Berger, et al, 1984). The LLDP authorities in Malawi distributed project land that had been expropriated from a long standing system of matrilineal land inheritance to male heads of household, many of whom were migrant industrial laborers (Rogers, 1980).

The redistribution to men of land held by women either through traditional usufruct rights or as personal property is well documented in the literature. Some of more frequently cited authors who have dealt with Sub-Saharan Africa include Ester Boserup, John de Wild, Jennie Dey (The Gambia), Barbara Rogers, Zenebeworke Tadesse, Jette Bukh (Ghana), and Barbara Issacman and June Stephen (Mozambique).

The redistribution of land away from women can have detrmental effects upon women's productivity and the economic development of their agricultural enterprises. First, individuals who own land or lease it for extended periods of time have greater incentives to invest and maintain the land. Second, ownership of land is often a prerequesite to obtaining loans of participating in programs, e.g. cooperatives. Finally, researchers and program designers often select their target populations from registeries based on land ownership, e.g. tax registers. Without access to land, women have less incentive or ability to invest and are apt to be overlooked as appropriate program participants.

4.4.2 Women's Role As Provider of the Family's Food

In Sub-Saharan Africa, it is primarily the responsibility of women to provide food for the children, herself and her husband (see sections 2.1.1 and 3.3.4). Therefore, development programs which include

redistribution of land or resettlement require the incorporation of fields for food crop production.

Bellancle and Gentil found that women of the SODENKAM settlement of Cameroon spend an "inordinate" amount of time in the production of food crops (Lele, 1975:30). This is at least partly due to the fact that female farmers had been forced from their land that had been cleared near the village to allow for expansion of coffee and cocoa production. New food crop fields had poorer soil quality and were located three to six, and in some cases as much as ten, kilometers away from the village (Tinker, 1981:62).

In Nigeria, resettlement schemes did not provide garden plots for women to grow the family's food. Furthermore, the income from cash crops, for which women contributed a large portion of the labor, was given directly to the men (the corporate head of the household). This left women without means of providing her family with food, home grown or purchased, and therefore reduced the family's level of consumption (Tinker, 1981:62).

The Mwea settlement program mentioned earlier allocated small plots for women's home gardening activities. Unfortunately, the size of the plots were inadequate; the program designers had assumed that the new irrigated rice crop could provide for at least some of the family's food needs (Tinker, 1981:62). The men, however refused to consume the rice, a non-traditional foodstuff, and the women were forced to sell the rice for more expensive traditional food.

The women of the settlement were extremely dissatisfied with the design of the program as well as their unremunerated role in the production of rice. Chambers and Moris noted a high rate of desertion

from the project by wives of participating male farmers (Chambers and Moris, 1973). Consequently, the program was:

> ...undermined by women's refusal to devote the time needed to the rice crop, and their black-market trading in rice, the only source of income for them. Another even more drastic response was for women to abandon the settlement scheme altogether (Rogers, 1979:6).

The Autorite des Amenagements des Vallees des Volta (AVV) of Burkina Faso and the French designed a resettlement scheme to develop the White and Red Valleys. Female-farmers were considered marginal to the project, hence, there was "...little consideration of women's semi-autonomous production in the initial stage of the project" (Gladwin, et al, 1984:11). One year after the first 250 families moved into the settlement, women began to leave, families threatened to move out and new families were reluctant to move in. A major complaint was that no land had been allocated to women for food crop production. Many women claimed their children were going hungry (Rogers, 1979:5).

A final example is that of a resettlement scheme in Senegal (Gladwin, et al, 1984:18). Women threatened to return to their home villages if land was not provided for them. The authorities managed to find sufficient available land.

4.4.3 Female Labor Constraints

For female farmers of Sub-Saharan Africa, labor is a scarce resource. Frequently, their limited cash income or surplus production combined with their heavy burden of providing the basic needs of their families inhibit the possibilities for hiring labor. Cultural restrictions on the employment of men also limit their available labor supply. Therefore, female farmers generally depend exclusively on their own labor and that of their children and close relatives. They are also

generally obligated to work for their husbands.

Many project designs, however, disregard women's time constraints and overlook the wide range of activities for which they are responsible, especially those not directly related to field work. The outcome is often an imposition of severe over exertion on the part of female farmers/producers (Lele, 1975; Cleave, 1974; Burfisher and Horenstein, 1981; Farrington, 1975 and Levi and Havinden, 1982).

Additional factors contributing to the dissatisfaction with the AVV project in Burkina Faso were related to women's increased burden. The women who either left or threatened to leave the settlement complained that the wells were far from their houses, there was insufficient fire wood, an the work was exceptionally hard and of a long duration (Cloud, 1977 and Rogers, 1979:5). The innovations introduced through the Lilongwe Land Development Project (LLDP) were said to have been difficult to implement because they increased the already heavy workload of women (Rogers, 1980:171).

Most efforts to increase agricultural production through the application of new technology have concentrated on improving the productivity of land. According to the World Bank, however:

> Over the last decade, it has been recognized that labor bottlenecks are a key constraint ot agricultural progress in Africa...[yet]...most of the methods encouraged still aim to increase productivity of land (fertilizer and seed packages). More emphasis should now be placed on measures that increase labor productivity, in particular, use of farm implements, ox-drawn cultivation, use of cereals processing equipment (winnowers, threshers), and equipment aimed at reducing labor input of women's tasks (mills, improved water supply) (World Bank, 1981:75).

Uma Lele points out that tractorization, a popular concept in Tanzania, simply postpones the labor bottlenecks (Lele, 1975:33). The expansion of

hectarage due to tractor use increases requirements for weeding, harvesting, etc. Similarly, line transplanting, a technique often recommended by "Training and Visit" extension services requires more weeding. Women have resisted attempts to implement line transplanting in Senegal and Madagascar (Berger, et al, 1984:43). To enhance production through tractorization or line transplanting, complementary inputs such as herbicides, mechanical weeders and new weed controlling planting techniques must be introduced simultaneously.

It is estimated that about 80% of all water pumps in Third World countries are inoperable (Ashby, 1981:130). Given the amount of time women invest in fetching water, they may be interested in learning how to maintain and repair them. The reduction in labor required for water collection could allow women to spend more time in food production.

Construction of food storage facilities and regulation of food supplies are also predominately women's responsibilities (see Chapter 2). The estimated losses of grain in storage for West Africa are impressive: Ghana, 75%; Nigeria, 30-70% over an six to eight month period; Ivory Coast, 20-90% of all maize stored; and Benin, 30-50% in five months of storage (D'Onofrio-flores and Pfafflin, 1982:91). Under these circumstances, a logical food security strategy would be to promoted improved storage facilities and train women how construct and maintain them.

Of course a farmer's decision to adoption a particular technology will be based in part on whether the appropriate complementary inputs are available and there are accessible markets (Harwood, 1979:14). For women, under the present institutional arrangements, these two conditions might be severely constrained.

4.4.4 Women's Independent Need For Credit and Purchased Inputs

Credit and subsidized input purchasing services commonly furnished through agricultural development programs rarely incorporate female farmers. For the compilation of institutional registers, husbands and wives production activities are considered part of one household, and the men are listed as the head or representative. Frequently, wives are not even registered. These institutions then limit the servicable population by dealing strictly with the male representatives.

Women were inadvertently excluded from the credit services associated with the extension programs of Malawi, Kenya and Tanzania (see section 4.3.2.2, Table 14 and section 4.3.2.3 respectively). The LLDP extension program relied upon a register of growers that omitted a large portion of the female-farmers. In Kenya, the lack of female extension agents, the inability or reluctance of male extension agents to address women and the use of locations inaccessible to women for disseminating credit information all inhibit female farmers' ability to obtain loans. Women of the Morogoro and Arusha regions of Tanzania were unable to obtain the necessary recommendations from local village chairpersons, who are frequently traditional male elders of the opinion that women do not purchase inputs or farm independently (ICRW, 1980a:27).

In Botswana, women were denied access to credit and subsidized inputs, both services allocated through the extension agents (Ashby, 1981:130). The hybrid maize program of Ghana (see section 4.3.2.1) contained a credit provision but female-farmers were denied access. Women can be indirectly excluded from acquiring loans by prohibiting

their membership in cooperatives that administer the credit or by administering credit according to land ownership. In Kenya, Zambia, Lesotho and Tanzania, women were unable to obtain loans because they did not meet the minimum land ownership requirements (Fortmann, 1982; Blumberg, 1981; Staudt, 1982 and Lycette, 1984).

4.4.5 Women's Need for Access to Product Markets

Organized marketing and more specifically market cooperatives are another institutional arrangement with generally restricted access for female farmers. According to an FAO survey:

> Access to agricultural co-operatives has actually not been available to women, except for legal heads of households, as husbands represent the family, hold the voting power and collect the profits. Requirements such as ownership of land are often obstacles to women's membership...when membership is open to women, traditional customs tend to limit their participation, especially at the management and decision-making levels (UNDP, 1980:67).

Furthermore, registers of marketing organizations, cooperative or not, tend to function in a similar fashion as with credit institutions; the women are subsumed under their husbands authority (see section 4.4.4). Exceptions are those registers which contain information on women only such as cooperatives or project registers used specifically for "women and development" programs.

As mentioned in section 2.2.6, when the Nigerian government sponsored milk and groundnut cooperatives, they restricted membership and ownership to men (Ahmed, 1978:9). Similarly, the grain cooperatives of Senegal have excluded women (Sene, 1980:16).

The new hybrid yellow maize that was introduced as part of the Isoya Rural Development Project in Nigeria, also mentioned in section 2.2.6, established a marketing board for male producers. No females were

permitted to join, although they traditionally marketed local white maize. Commenting on the impact of project on women, Lapido wrote:

> Within the first two years of its inception, the maize project created a gap in the women's marketing cycles...Many women who had already established their own independence found themselves turning to their husbands for capital (Ladipo, 1981:124).

4.4 Suggestions For Improving Development Programs

After reviewing the extension systems and other development programs of Sub-Saharan Africa mentioned above, a number of suggestions can be identified to improve their design and implementation. Generally, programs need to be assessed as to whether they provide services to appropriate target populations given their explicit objectives. Where women are agricultural workers, whether upaid family labor or self-employed in cash or subsistence production, the design and implementation of programs should refect their role. This is especially important in cases where the objectives of programs are to obtain food security or to increase production, productivity or the standard of living of rural inhabitants.

Table 15 provides a summary of section 4.4. The table contrasts the extent of women's contribution to agricultural production and the incidence of female headed housedholds with the existence of programs that neglect to incorporate women and/or overlook women's full responsibilities. The information contained in Table 15 reveals the inconsistency between program design and actual production systems of a variety of African countries. With the exception of Mozambique, women dominate agricultural activities and comprise between 31% and 75% of all household heads; yet, project services are inaccessibel for women. Seven

of the ten countries listed have programs that prohibit women from owning land or obtaining credit and inputs. Five countries have programs that overlook women's labor constraints. Overall, the programs cited

Table 15

Summary of African Programs

Country	Women's Agricultural Contribution	Female Household Heads	Neglected Women-Related Factors: Land	Labor Constraint	Women's Provider Role	Credit/ Inputs
Botswana	40-80% crop activity	46-80%				X
Burkina Faso	74% crop activity			X	X	
Cameroon	55% of ave. "man" days			X	X	
Ghana	54% ag. self-employed/employees	30-50%	X			X
Kenya	80% sub. ag.	31%	X	X	X	X
Lesotho	85% ag. labor	>30%	X			X
Malawi	-	75%	X	X		X
Mozambique	34% ag. labor	25%	X			
Tanzania	51% ag. labor	51.1%	X	X		X
Zambia	>50% labor/ hector	47%	X			X

Note: This table does not infer that all programs in countries listed poccess the same inconsistencies found in the programs discussed in the text.
Source: Tables 1 and 7 and the text of section 4.4.

here require extensive design alterations and changes in the methods of implementation. Means of identifying and correcting misdirected efforts must be incorporated into their designs.

First, it is critical that development programs directly address women whether they are semi-autonomous farmers or strictly home producers. Two-way, iterative communication is required between the designers and administrators on the one hand and the female participants on the other hand (Hale, 1982).

At the design stage, women are better able to express their concerns and constraints than male proxies. Section 4.2.2 has demonstrated that men often inadvertantly, or even purposely, misrepresent the participation, needs and contraints of their womenfolk. For example, the existence of female labor constraints is revealed through interviews with women themselves, yet men may preceive that women's constraints are minimal. In addition, women are apt to more readily accept new technologies and cultural practices if they feel at least partly responsible for their introduction. The success of a particular innovation is fundamentally dependent upon its usefulness to the farmer.

At the implementation stage, it is critical to directly address female farmers. Programs that address "family farms" should include husbands and wives as distinct participants and acknowledge, and where appropriate, incorporate both individuals' work activities.

It should not be assumed that men will transfer pertinent knownledge to relevant household members. Staudt found that Kenyan women, who provide the bulk of the agricultural labor, were less informed about new innovations then their husbands. Moveover, husbands frequently misunderstood or forgot the instructions (Staudt, 1982:7). One observation of the extension system in Tanzania implies that there too information does not necessarily transfer from the men to the women; Tanzanian men were one to five times more likely than their wives to have knowledge of a given recommendation (Ashby, 1981:159).

As mentioned in section 4.3.1, the best results of education and extension are derived when the recipients of information are the individuals who actually perform the task to be modified. These

individuals have both the most background knowledge and the incentive to utilize the new information. Accordingly, technology related to water, storage, agricultual product processing, and many field activities should be introduced to women. Where women are responsible for the maintanence of and administration of traditional medicine for livestock, new medications and small diagnostic laboratories should be managed by women.

Moock's study revealed that women were more inclined to utilize the information, the impact of education of women on output was greater, and that "women who farmed alone turned out to be better managers than the men" (Boulding, 1975a:13). Bond's study suggested tht women diffuse information faster than men (Bond, 1974). Similarly, Ladipo found that in rural Nigeria women's cooperatives established record keeping long before men's. It was their example which influenced the men's cooperative to adopt record keeping practices (Ladipo, 1981:131).

For adequate delivery of information, the sexual composition of enrollments for extension agents and farmer training course should reflect the sexual distribution of contributions to various production activities. Instructions and demonstrations ought to be provided at times and locations convenient for women. Adequate child care and dormitory facilities need to be furnished.

Existing women's organizations can incorporate instructions provided that the organizations poccess sufficient human and capital resources to undertake a training program, and provided that the membership includes women of the targeted population: many women's organizations represent elite, non-agriculural women. Voluntary organizations, although useful under many circumstances, are not always

appropriate where women face strict time constraints or have a high opportunity costs.

One method of information dissemination, used in parts of Africa with varying success in rearching female farmers, is the "farm forum." The farm forum is comprised of village members who regularly meet to listen to educational radio broadcasts and jointly review supplementary printed material. In Ghana one farm forum program achieved 54% female participation, while a similar figure for a Nigerian program was only 10% (Berger, et al, 1984:49).

Organizing female producers or traders into cooperatives or associations establishes a visible and effective collective force that can increase each individual woman's chance of obtaining access to government services, e.g. credit, inputs, information or product transport facilities. Forming "block farms" (bringing a number of small farm parcels together to form a larger block) enables women to collectively 1) meet minimum land requirements for loans and marketing services, or 2) achieve economies of scale and perhaps mechanize a number of production activities. Furthermore, as a block or cooperative, women are more likely to be acknowledged by researchers and policy-makers.

The second major alteration required of development programs is that the content of programs for women has to be reoriented from home economics to productivity enhancement.

> Two thirds of all USAID WID [United States Agency for International Development's Women and International Development Office] projects can be classified as family welfare programs and only one-third as productivity increasing programs (ICWR, 1980b:28).

Section 4.3, concerning extension programs, reveals that women's

training programs focus on home economics and the introduction of new skills, e.g. knitting, which neither enhance the productivity of women in their present activities nor generally provide addtitional income. In contrast, FAO interviews with non-profit private organizations, government agencies and spokeswomen for various women's groups throughout the Sahel demonstrate that rural women are requesting labor-saving technology, activities for supplemental income earning and technical assistence and training (Cloud, 1977).

Assessments of extension and other development programs accessibility to women must go beyond whether or not women are in some way included in the designs. First, programs should be checked to see that they accurately represent women's roles and needs as defined by women themsleves. Second, programs need to be evaluated with respect to their ability to deliver appropriate information to women. Incentives should be provided to reward those programs and institutions that make progress in rearching female farmers. Finally, the creation of women specific programs and institutions is considered a second best solution to the integration of women into national, regional and local development efforts. A sexually segerated approach to development is costly, unnecessarily redundent and apt to result in a distribution of wealth which based on sexual discrimination.

CHAPTER FIVE

SUMMARY AND CONCLUSIONS

5.1 Summary

The review of the literature concerning women's contribution to agricultural production reveals a number of useful observations and general tendencies. First, women do provide a significant portion of the labor inputs. They are responsible for providing water, fuel, informal education; gathering wild herbs and other useful plants; transporting products and inputs and for administering family as well as livestock health. In the field, women generally contribute to planting, hoeing, weeding and harvesting (For further information see section 2.1 and Tables 1 through 4).

Even where religious seclusion is practiced, women undertake production activities within the compound or close to the house. These activities may include, as with Hausa women, marketing of agricultural products or prepared foods and beverages. Storing and processing agricultural products and preparing family meals are also the responsibility of women. Finally, throughout many regions of the Third World, women market agricultural products as well.

Second, variability is found in both the extent and type of contribution from women. The women with the greatest amount of responsibility are from Sub-Saharan Africa. Variables which influence the degree of their contribution include: seasonality, religion, class, male out-migration, technology, education of children, cultural expectations for women and the disposition of crops, i.e. grown for cash

or subsistence (see section 2.2). Male out-migration and education of children, especially girls, increases women's workload. Class status, in contrast, is generally inversely related to women's contribution.

Third, the literature suggests that women contribute significantly to decision-making. Female farmers manage their own subsistence fields, vegetable gardens and in many areas of Africa cash crop enterprises. (See section 3.3.5 for more information on female managers of cash crop enterprises in Sub-Saharan Africa.) These activities are, however, interdependent with other household production activities because women have obligations to provide labor for the production of their husbands' crops and they often have joint responsibilities with their husbands to provide cash for their children's clothes and education.

With the exception of these independent agricultural activities for which women take essentially complete control, husbands and wives share in decision-making. The pattern that emerges from the literature is that women make decisions concerning cultural practices, planting, input use, seed selection, livestock maintenance, storage, processing and distribution of output among family members, livestock and the market. Men, on the other hand, dominate decisions concerning input purchases, large capital outflows, often grain disposal and the selection of crops to be cultivated in their own fields (see section 3.3.4 and Tables 8 and 9).

Forth, women are important family providers, measured in cash earnings or home production (see section 3.3.4). Latin American surveys indicate that, contrary to popular wisdom, women's income often amounts to 50% of the total family income. Home production activities of Asia and Africa commonly represent from one half to two thirds of the total

family income. Furthermore, women of regions with high rates of male out-migration frequently do not receive a regular cash remittance from their menfolk. A number of studies have suggested that the welfare of the family is more strongly correlated with women's income than is it with men's.

Fifth, the incidence of female headed households is high throughout the world. The percent averages of households headed by women for the world and Sub-Saharan Africa are 25-30% and 22% respectively. For specific countries and/or regions within countries of Sub-Saharan Africa, these figures can be as high as 80% for some villages in Botswana and 75% overall in Malawi (see Tables 7 and 15 and sections 3.3.2 and 3.3.3).

Finally, throughout the world, there is considerable variation in the socio-economic structure of households (see sections 3.3.1 and 3.3.2) which allows for various degrees of interdependence among individuals working within separate spheres, e.g. production, consumption, budgetary and investment spheres. Specifically, members of a common residence may not be members of the same production or consumption unit and therefore may exert only a minor influence over each others activities.

In Africa, men and women typically maintain separate fields to meet their individual responsibilities to their families. While women produce crops mainly for the families' daily subsistence, men produce for larger, periodic purchases or for long-term investments. Therefore, their production objectives and strategies may be quite divergent. Similarly, where polygyny is practiced, a family may form single or multiple consuming units depending on whether or not the wives live and

work together within one compound.

Given these six observations, it appears that pre-existing theories and models of farm production do not adequately represent female farmers of the Third World and their food crop production activities. A review of standard methods employed in research and policy formation directed at semisubsistence food production suggests the need for a new theory or supplemental concepts that specifically analyze and explain such a system.

In general, neoclassical, marxist and feminist theories need to be expanded to incorporate non-market production of goods and services. Current economic theories focus almost exclusively on the market. Consequently, the valuation of non-market production and the knowledge of non-market incentives are only rough or approximate. Because of the market focus of neoclassical, marxist and to a lesser extent feminist theories, they have greater analytical and explanatory capabilities with regard to developed rather than less developed economies, which have fewer established markets. The larger the share of production that takes place outside the market, the more limited is the analytical and explanatory power of a market model.

These theories are also limited in their ability to explain and predict micro-level farm behavior under semisubsistence conditions. While Marxists and Feminists consider institutions and the distribution of power and wealth central to their analyses, they provide few specific practical tools, especially for micro-level quantitative analyses. In contrast, Neoclassicalists provide practical tools but generally assume a given distribution and set of institutions. (For more information, see section 3.2.3.)

The use of the standard family farm model (see section 3.1.2 and 3.2.3) as a unit of study has questionable validity within a Third World context. The assumptions that the family farm is comprised of a cohesive group of people whose members all contribute to one production unit, jointly consume all products and possess similar or identical tastes and preferences, which, in turn, allows any one member's choices to represent that of all other members is overly simplistic and incorrect. The previous discussion suggests that the household should not be assumed a homogeneous unit unless it actually is. Otherwise, this model is an unwarranted simplification. Similarly, the corporate male head of the household should not be automatically assumed the provider, the farmer/producer and the decision-maker.

Like the theories themselves, standard definitions of production generally reflect the same emphasis on the market. There is a tendency to label activities that take place in the market as production, and activities that take place within the home or outside the market as consumption, e.g. a commercial mill grinding grain into flour is production, while a woman pounding grain for home use is consumption.

Production definitions such as "economically active," the "gainful worker" and "marketable output" include commercial goods and services or activities for which there are generally markets. National population censuses and organizations that collect basic international data commonly use the first two definitions of production. Consequently, data collected by these sources underestimate production and contain limited information on people who, and sometimes whole geographic regions of a country that predominately work outside the market.

Many existing data bases and new data to be extracted via standard

data collection procedures have or will have overlooked much of the production activities of women and the informal sector as well as various production components of the semisubsistence agricultural system. This oversight is due largely to the tendency to count only formal, market activities and to subsume a number of quasi independent activities (market or non-market) under one target individual and/or a theoretically central enterprise, family farm or household.

Of the definitions mentioned in section 3.2.1, the FAO's incorporates the widest range of productive activities. Supplementing this procedure with the collection of home production information could provide a fairly complete picture of rural production activities.

A review of common interview questions and methods of implementation indicates that the data collected reinforces the limited family farm model; and yet, the data are not representative of the population they attempt to describe (see section 4.2). Surveys, especially national censuses, consistently underestimate women's work and their contributions to family income because: 1) sampling frames systematically exclude women; 2) for gathering information concerning women, male proxy respondents are interviewed instead of women themselves; 3) unclear definitions of work are used, which often suggest that the production activities of women are not considered work; and 4) secondary as well as intermittent production activities are frequently excluded from production data.

A number of suggestions to improve both data collection methods and the design of interview guide questions are provided in section 4.2. Incorporating these suggestions in data collection procedures could enhance the quality of data bases and background material developed from

such procedures.

The use of conversion factors contribute further to the underestimation of women's production. However, the assumption that there is greater variability in labor productivity between sexes than among the sexes has not been substantiated. It was noted that if female labor input figures of existing studies were re-estimated using a weight of one (male and female labor are equivalent), their contribution would appear to increase substantially. For example, where women's contribution was determined to be 30% using an overall conversion factor of .6 or .7 (both weights were cited in section 3.2.4.3), the re-estimated figures for women's contribution, using a weight of one, would be 50% and 43% respectively. Furthermore, a number of researchers in the field suggest that conversion factors or weights for aggregating different labor types, e.g. men, women and children, are arbitrarily derived and of little analytical utility.

5.2 Policy Implications

The limitations of pre-existing theories, models of farm production and data collection procedures discussed thus far have important policy implications. Reliance on incomplete data bases similar to those previously mentioned, obstructs the identification of appropriate target groups and individuals who comprise these groups. The selection of production definitions and the design of interviews modify the type of information collected and used in designing programs (see section 3.2.2). Thus, fulfillment of government objectives to reduce unemployment or underemployment, to alleviate poverty and to improve the standard of living of rural inhabitants may be thwarted by the use of data and information that disproportionately represents a subset of the

target population who are tied to the market.

The provision of government services may be highly skewed toward this group and underutilization of resources in the subsistence sector may not be fully appreciated. Similarly, market purchases and cash incomes may not accurately reflect the standard of living where home production is an important contributor to total income. Furthermore, food security policies may be misdirected if food production and consumption estimates are inaccurately measured due to extensive undercounting of subsistence activities as well as to a lack of information concerning the final disposition of agricultural products.

The lack of data covering the full range of home production activities can lead to unrealistic calculations of available labor. Projected future project output levels may not be reached if significant unpredicted labor constraints arise. Project underachievement due, in part, to unrealistic estimates of available female labor has been well documented in the literature. The data in Table 15 and section 4.4.3 provide some examples.

Utilization of the family farm model and incomplete data bases for the purpose of designing policies programs can lead to limited and/or undesirable outcomes. (See sections 4.3 and 4.4 for exemplification.) The assumption that the various production units linked to a single corporate household are consolidated and jointly managed suggests that entitling land to a male, corporate head of the household is an innocuous transaction; yet, this often results in a redistribution of land from women's food crop activities to men's cash crop ventures. Redistribution of food form local subsistence uses to urban or foreign consumption is implied as well. Section 4.4.1 and 4.4.2 provide examples

of land distribution through colonization, land reform and the implementation of resettlement schemes as well as other agricultural projects.

Analogously, appropriate recipients of credit and marketing services as well as information and training in new technology and cultural practices are overlooked when selection criteria assume a unified family farm model directed by a single male head of the household. Men, frequently the only recipients, often do not disseminate information throughout the corporate household and new technologies are not shared with other household members. In fact, non-agricultural, migratory males are frequently recipients of agricultural programs. In addition, unrealistic assumptions that women are home-makers and men are agricultural producers and family providers reinforces this sex-segregated distribution of information and services (see sections 4.3 and 4.5).

Extension agencies, in particular, have been notorious for overlooking and down playing women's contribution to agricultural production and to family decision-making. As a result, there is severe sex-segregation in the content and administration the agencies' programs, and most do not adequately reach female farmers. Similarly, development projects undertaken to assist women tend to be in the form of welfare programs, lacking services in technical advancement or for improving their economic efficiency and opportunities.

This method of program delivery has two important shortcomings. First, the rate of adoption of new technology and cultural practices is constrained because a large portion of producers and managers (i.e. female farmers) are uninformed or disqualified. Second, efforts to

increase agricultural production are disproportionately applied to cash crop production, often destined for urban and export markets, and rarely applied to local food production. Higher export earnings, which could be used to purchase food; increased supply and lower prices of food in urban centers; and higher incomes for rural producers of cash crops are all possible outcomes from these approaches to program delivery. However, without a concurrent increase in local food supplies, it is unlikely that rural food security would be improved with these methods.

Because a single budgetary unit is assumed under the family farm model, the male, corporate head of the household commonly receives remuneration for the entire family's participation in agricultural projects. However, as mentioned in sections 3.3.1 and 3.3.4, purchases and budgets are often sex-specific. Women are generally responsible for the daily subsistence of the family and small purchase items, while men are responsible for large, periodic purchases.

This contradiction in the system of remuneration may then lead to an expansion of the budget for large, periodic purchases or men's cash crop ventures, while the budget for small purchases, household consumption items and subsistence production activities diminishes. Consequently, an increase in production of commercial agricultural products might be accompanied by a reduction in local food security.

Section 3.3.4 cites a number of studies undertaken in Malawi, India, Colombia, Tanzania and Africa in general which suggest that family welfare is more strongly correlated to women's incremental income than men's. Furthermore, several other studies indicate that men tend to spend their incomes on consumer and luxury goods, alcoholic beverages and entertainment. These studies suggest that increments in men's

incomes may act as leakages from the local income pool to urban, commercial centers or overseas, depending on the origin of the consumer and luxury goods and the cash inputs. In contrast, the purchase patterns of women indicates that increments in women's incomes are inclined to remain in the local income pool and further spur local growth and employment through a multiplier effect. (Section 4.5 presents suggestions for correcting some of these problems and improving development programs.) Both of these points provide arguments for including women as managers in projects which promote cash crop cultivation.

It is evidenced by the preceding discussion concerning the relevance of present theories, models and research methods in subsistence production analyses that there is a need for the development of a new farm model and for modifications in research techniques. Some specific points that are presently overlooked but that need to be incorporated into the model are the following.

First, the term "farmer" should be more clearly defined. Determination of whether a person who owns, manages or works the fields qualifies as a farmer can relieve some ambiguity as to who is an appropriate member of the target population. This can promote greater consistency between project objectives and project participation and distribution of benefits.

Second, it is important that models and data collection procedures identify decision-makers. Policies and programs can be made more effective if the incentives, both market and non-market, of decision-makers and producers are understood better.

Third, concepts need to be developed in order to analyze and

explain the intrahousehold distribution of wealth and resources as well as the interdependence among semiautonomous units within the corporate household. Delineating the various production, budgetary, consumption and investment units according to specific individuals responsible for their execution can provide insights into the distribution of labor, purchased inputs and other resources; of income and expenditures and of decision-making authority among the various units. Information of this kind can assist program designers and administrators in identifying appropriate recipients of services, in appreciating the often unique resource and institutional constraints of specific production units and in improving the delivery of services. Appendix A contains an example of a set of survey questions which could extract some of the necessary information.

For example, cash crop cultivation may operate with consultation from extension agents, with loans for purchasing inputs such as fertilizers and ploughs, and with guaranteed markets via government purchasing agents, while subsistence crop activities may not have access to any of these services. For the fulfillment of food security objectives, it may be useful to know whether specific food production activities rather than the household in general, with multiple enterprises, receives services or adopts new technologies and cultural practices. It may be more effective to target specific enterprises rather than specific households.

Given the role, responsibility and authority of women with respect to agricultural production, and especially food crop production, it appears that food security strategies of Third World countries need to directly address the issue of women's participation in agricultural production. Furthermore, women must become involved in the design and

implementation of such strategies. Finally, female-farmers should be viewed as semi-autonomous producers, important providers of their families' basic needs, and worthy recipients of development program services in their own right.

5.3 Suggestions for Further Research

As indicated by the previous two sections, there is a need for new theoretical research. Specific items requiring further exploration are: 1) the valuation of non-market goods and services, 2) the mechanisms which determine the flow of resources and output between market and non-market uses, and 3) incentives, both non-market and those unique to female farmers in Third World contexts.

Suggestions for practical research are more numerous. Virtually all national data bases could be upgraded with new information extracted by surveys that follow the recommendations of Chapter 4. It is recognized that agricultural surveys are expensive propositions; nevertheless, they are warranted in regions where intensive development efforts are undertaken.

Basic research can be undertaken to identify resource and institutional constraints of female farmers, to determine female farmers' responsiveness to specific policies and programs, and to measure the economic efficiency of their farm enterprises. The results of such studies can provide important insights into the strengths and weaknesses of agricultural programs in reaching women and influencing their agricultural production activities. The opportunity costs (primarily in the form of women's labor) and the decision-making criteria used in trading off resources between the various units within

a corporate household might also be better understood.

Results of basic research concerning female farmers can also be compared to similar studies of their male counterparts. Comparisons between male and female managed farms are illustrative; however, the results can also be misleading. It is difficult to compare male and female productivity or managerial capabilities when there are uncontrolled factors affecting the outcome of the study such as the absence of household members responsible for critical tasks. For many female managed farms, the males who are responsible for acquiring draught animals or preparing the land are absent (Peters, 1984). When men are absent, cash income is often limited. It would be inaccurate to compare these farms with male managed farms that have all the laborers present (wives and children), and draw conclusion concerning the managerial capabilities of men and women.

Further research should be undertaken to identify whether or not extension and other agricultural programs reach female farmers, and whether the quality and type of information delivered is representative of women's actual roles. Generally, the quality of information received by women and the extent of resources allocated to the delivery of such information should be at least equal to that received by men. In some cases where discrepancies are identified, simple remedies such as hiring more female extension agents or inviting women to attend male dominated organizations can be employed. Cultural constraints, however, can make these remedies inoperable. Under such circumstances, alternative methods of dissemination of information should be researched and administered.

APPENDIX

APPENDIX A

QUESTIONS TO ADDRESS FOR DETERMINATION

OF TARGET INDIVIDUALS

A) Family Needs
   1. What are the family's needs for consumable food?
   2. What are the family's needs for food products?
   3. What are the family's needs for cash?
      3.1 For consumable food and food products?
      3.2 For other necessities?

B) Division of Responsibility for Meeting These Needs
   1. Consumable food
      1.1 What items do women provide?
      1.2 What items do men provide?
   2. Food Products
      2.1 What items do women provide?
      2.2 What items do men provide?
   3. Cash for Consumable Food and Food Products
      3.1 Which purchased items do women provide?
      3.2 Which purchased items do men provide?
   4. Cash for Other Necessities
      4.1 What competing uses for cash do women have?
      4.2 What competing uses for cash do men have?

C) Activities Undertaken to Fulfill These Responsibilities (Whose Labor and Whose Decisions)
   1. Consumable Items Provided by Women
      1.1 What are women's labour inputs and what are men's labor inputs in terms of activities, time and proportion of total?
      1.2 What are women's decision-making inputs and what are men's decision-making inputs?
   2. Consumable Items Provided by Men
      2.1. What are women's labour inputs and what are men's labour inputs in terms of activities, time and proportion of total?
      2.2 What are women's decision-making inputs and what are men's decision-making inputs?
   3. Food Products Provided by Women
      3.1. What are women's labour inputs and what are men's labour inputs in terms of activities, time and proportion of total?
      3.2. What are women's decision-making inputs and what are men's decision-making inputs?
   4. Food Products Provided by Men
      4.1. What are women's labour inputs and what are men's labour inputs in terms of activities, time and proportion of total?
      4.2. What are women's decision-making inputs and what are men's decision-making inputs?

5. Cash for Consumable Food and Food Products Provided by Women
   5.1 What additional labour inputs are provided by women to obtain cash for consumable food and for food products?
   5.2 What additional decisions are made by women and by men regarding these activities?
6. Cash for Consumable Food and Food Products Provided by Men
   6.1 What additional labour inputs are provided by men to obtain cash for consumable food and for food products?
   6.2 What additional decisions are made by women and by men regarding these activities?

D) <u>Control Over Products Obtained From the Activity</u>

1. Who controls the disposition of consumable items provided by women?
2. Who controls the disposition of consumable items provided by men?
3. Who controls the disposition of food products provided by women?
4. Who controls the disposition of food products provided by men?
5. Who controls the disposition of cash obtained from items mainly worked by women?
6. Who controls the disposition of cash obtained from items mainly worked by men?

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