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Agricultural Extension for Women Farmers in Africa

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Operational guidelines on how to provide cost-effective agricultural extension services to women farmers in Sub-Saharan Africa.

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Policy, Research, and External Affairs

WORKING PAPERS

Women in Development

This paper — a product of the Women in Development Division, Population and Human Resources Department — is part of a larger effort in PRE to develop sector-specific guidelines on cost-effective interventions to enhance the productivity and well-being of women. These guidelines will reflect the best available operational experience. Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Mila Villar, room S9-133, extension 33752 (54 pages).

Women are responsible for at least 70 percent of food staple production in Africa. They are also important in food processing and marketing, cash cropping, and animal husbandry. They are both laborers and decisionmakers — and as more men migrate from the rural areas for work, an increasingly large number of women are managing farms on a day-to-day basis.

Women farmers operate under greater constraints than men, constraints of which there is too little awareness. Women have less access to information, technology, land, inputs, markets, and credit. As primary caretakers of children, they have less time and mobility — and in Africa they are often illiterate. They need effective agricultural extension services, but these services are still geared toward male farmers, both in content and delivery method.

Extension systems should be modified — with women farmers helping design changes — to better reach women farmers. The extension message should be more tailored to the needs of women farmers. To this end, the information and technology needs of women farmers should be identified more effectively, and the links with agricultural research institutes strengthened so that they address women's activities and constraints. Tools and machines appropriate for women farmers should also be designed and made more easily available.

To ensure more effective delivery of the extension message to women, there should be a concerted effort to increase the number of female extension agents. Until more female extension agents are trained, female home economists and "animatrices" should be re-trained and redeployed, and female agents presently in the extension system should be used as initial contacts with women farmers to familiarize them with the extension system. It is also very important that male extension agents be trained to work more effectively with women farmers.

The extension system should identify ways to extend services to women to overcome constraints on their time and mobility and their limited education. Suggested approaches include mobile training courses and wider use of such mass media as radio and video cassettes. More generally, there should be a substantial increase in the number of female contact farmers to better reflect their significant role in the sector. The use of women's contact groups is a particularly cost-effective way of providing extension. Monitoring and evaluation should include gender-disaggregated indicators to better assess the impact of extension on both men and women farmers.

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EXECUTIVE SUMMARY

1. Women are responsible for at least 70 percent of food staple production in Africa (World Bank, 1989a). They are also important in other agricultural activities, including food processing and marketing, cash cropping and animal husbandry. Women's involvement is significant not only in terms of their labor input, but also in terms of their decision-making authority. In fact, as more men migrate to cities and other countries for work, increasing numbers of women are becoming heads of households, managing farms on a day-to-day basis. To support their extensive and multifaceted roles in agriculture and to enable them to respond to market incentives more efficiently, women need effective agricultural extension services.

2. The evidence shows, however, that despite of a growing awareness of the need to reach women farmers, agricultural extension services are generally geared towards male farmers. This sometimes by design, but more often by default. Bias towards male farmers is evident in the delivery of extension, which is generally provided by male extension agents to men, on the assumption that the extension message will "trickle across" to women. Unfortunately, the evidence clearly shows that it often doesn't. It is also evident in the message itself, which tends to focus on the activities of male farmers rather than the much wider range of agricultural activities of women. Such an approach ignores the unique workload, responsibilities and constraints of women farmers and results in a highly inefficient use of resources, not to mention sub-optimal levels of agricultural production.

3. This paper proposes a series of operational guidelines on how to provide agricultural extension services in a cost-effective way to women farmers. All small-scale farmers, regardless of gender, face constraints, but the focus here is on women farmers in order to foster a better understanding of the particular gender-related barriers confronting women and the strategies needed to overcome them. Attention is concentrated on Sub-Saharan Africa in view of the crucial role of women in agriculture throughout the sub-continent. Worldwide operational guidelines for agricultural extension for women farmers are planned for later this year.

4. The recommendations have been gleaned from the experiences of African governments, the World Bank and other donors, and researchers. Ongoing pilot programs have provided useful guidance about what can work to integrate women fully into the agricultural extension system and what problems are likely to emerge in different socioeconomic environments. This is, however, an ongoing process: it is a relatively new field and much remains to be learned. It will be especially important to test alternative approaches over the next few years. This paper will then be revised to incorporate new lessons of experience.

5. This paper is organized as follows: Chapter 1 addresses the question of why women need help -- the role women have in agriculture, especially in Africa, and the particular constraints they face in terms of access to resources and information. Chapter 2 examines the information needed to

modify extension systems to better reach women farmers, to modify the focus of research to address women's activities and constraints, and to monitor and evaluate programs. Ways to collect such data are also suggested. Chapter 3 deals with the transmission of the extension message to women farmers -- the role of the extension agents and the importance of gender, the use of home economists and subject matter specialists, and the use of contact farmers and groups. The final Chapter examines the formulation of the message to be delivered, and the linkage between extension and agricultural research and technology.

6. While the recommendations and analysis contained in this paper are relevant for different extension systems, particular attention is given to the Training and Visit (T&V) system. Much of the World Bank's investment in extension has been in the T&V system, originally in Asia and now in many African countries. T&V extension is a management system which has the flexibility to be adapted to local conditions. These guidelines are intended for use by Bank operational staff and government extension personnel. They supplement and can be used in conjunction with previous World Bank publications on T&V extension.

Why Women Farmers Need Help.

a) Women farmers operate under greater constraints than men, and hence need special help. They have less access to information, technology, land, inputs and credit. Because women have primary responsibility for the home and child care, they also have less available time and mobility. While there is much regional variation, women in rural Africa are frequently illiterate, engaged in subsistence agriculture and unfamiliar with current technology, and are often perceived by male extension agents as being "non-adopters".

b) There is a lack of awareness of these constraints. Most policy makers, managers, agents and participants in agricultural support services are males who are not directly affected by the problems and needs of women farmers, and hence are not sufficiently aware of them. A number of initiatives are needed to improve awareness. These include collecting necessary information, redesigning surveys and questionnaires, improving staff knowledge and understanding of the subject, and generating feedback on progress.

General Guidelines for Project Design.

(1) Situation specific

Given the wide variation in circumstances between and within countries, a single methodology or approach for improving extension services for women farmers is not appropriate. The approach chosen for any particular situation must be suited to that specific situation, and should be based on the socio-cultural and religious precepts of the farming community and on the institutional organization and resources of the country.

(2) Start small, focus on a few key issues, and follow with sustainable and incremental expansion from a successful base.

Large scale, quick-acting remedies to the constraints of women farmers are not possible:

(a) financial and human resources are not normally available for comprehensive country-wide initiatives.

(b) many improvements will depend on changing attitudes -- a process which takes time, although it can be accelerated through deliberate efforts involving community leaders etc.

(c) certain changes in human capital take time. For example, increasing the number of female extension agents will require several years until training has been completed.

Consequently, it is advisable to start small and expand gradually from initiatives which have proved successful, and at a rate that the human and financial resources can absorb and sustain. This approach has been successfully adopted in Nigeria.

(3) Focus initially on testing approaches in areas with the highest potential for success

For the most efficient use of resources, begin with areas or approaches which have a high potential for success. These could, for instance, involve: (a) women's groups as the point of contact for extension; (b) pilot projects in villages with cooperative leaders or districts with supportive agricultural officers; or (c) new approaches centered round a popular radio program.

(4) Flexibility

Flexibility of design is essential when choosing situation specific initiatives. Flexibility over time, with continual monitoring and evaluation, is also important. Successful initiatives should be expanded and tried elsewhere, and unsuccessful ones dropped or modified. To make a start, short-term measures may be chosen with the intention of modifying later to conform with long-term objectives.

(5) Participation of women in design and evaluation

The most important resource of all is the women farmers themselves. They are the people most directly involved both as those affected by the constraints and as recipients of the extension advice and support. They are best placed to define the problems, to suggest solutions and to evaluate technologies. Ways should be found to involve women in designing and evaluating the extension service, both in terms of developing an appropriate message and delivering the message effectively.

(6) Cooperation of husbands and male leaders

Men at all levels of society can have a profound effect upon the success of women's programs. At the village level, unless their support is enlisted before embarking on women's agricultural programs of any sort, men may resist programs for their wives until they see direct benefits, as happened in Malawi, for example. (Evans 1989) At senior government levels, the support of departmental and regional managers is crucial to the effectiveness of programs for women farmers.

(7) An integrated extension system for all farmers

While women farmers do need special help, this must be provided through an integrated extension system. It makes no sense to have a parallel, separate system for women. This may take time, however, when there is a separate cadre of home economists or animatrices, with its own administration. A phased approach may then be needed. But all efforts should be directed to developing an integrated extension system which helps both men and women.

Suggestions for Project Components and Interventions

(1) Increase numbers of female extension agents.

Even in areas where there are no restrictions on male/female contact, communication with female farmers is generally enhanced when female extension agents (EAs) are used. To increase the number of female EAs, however, requires a long lead time and over the shorter term other means are needed. Suggested interventions are as follows:

- Increase enrollment of girls in agricultural colleges:
 - increase enrollment of girls in secondary schools. This is the factor most highly associated with female participation in intermediate agricultural training;
 - set target growth rates for women students at agricultural colleges;
 - make boarding facilities available at agricultural colleges;
 - remove irrelevant entry requirements;
 - provide common training curriculum for male and female students.
- Redeploy female agents already working with rural women. Female agents already teaching rural women subjects closely allied to agriculture can provide a quickly tapped recruitment source. Such

agents would be home economists in anglophobe African countries and animatrices in francophone Africa. Once suitable agents are identified, to develop them into agricultural extension agents:

- identify gaps in their knowledge;
- provide in-service training in to fill these gaps, particularly in agricultural skills.
- Improve conditions of employment of female agents:
 - provide same conditions of employment and same logistical support to male and female agents;
 - retain married and pregnant female agents;
 - help women meet their dual responsibilities of career and family, where possible select female agents from the area where they will serve.

(2) Improve contact and communication between male extension agents and female farmers.

Since most extension agents are and will be male, the effectiveness of their work with women farmers needs to be improved. This should be done through:

- Pre- and in-service training to enable male extension agents to work effectively with female farmers. Training should emphasize the following: diagnosis of women's agricultural activities and constraints the organization of rural women for extension purposes, techniques for working with women farmers, and providing feedback to researchers on technology needs. After training, staff incentives to encourage male extension workers to work with women farmers should be integrated into the reward structure.
- Gender targeting, i.e., using agents of the same gender as the farmer to make the initial linkage. Using female agents initially to work with women -- particularly women's groups -- can help develop farmer confidence in the agent and familiarity with the extension system. Once this process is accomplished, the female agent introduces the group to the agent assigned to the area (who is usually male), and moves on to work with another group. This approach has had considerable success in North West Cameroon.

(3) Improve the transfer of messages

- Increase the number of female contact farmers:
 - remove selection criteria that bias against women;

- encourage leaders to advocate publicly the selection of women contact farmers;

- emphasize selection of women farmers in training sessions for extension agents.

- Increase the number of female contact groups. Women's groups, and to a lesser extent mixed groups, provide a cost-effective way of channelling and providing feedback on extension services, and offer women the means of overcoming social and educational disadvantages. Groups can be multi-functional, or can focus on a single activity: extension, credit, communal crop or livestock production, labor exchange.

- Monitor extension/farmer contacts by gender and set targets. Regular reporting with data disaggregated by gender will increase the awareness of extension agents and encourage them to address the issues of women farmers.

- Identify ways to deliver extension services to women to overcome their constraints of time, mobility and lower educational levels. Suggested approaches are:

- mobile training courses to overcome difficulties of leaving the village or family to attend residential training;

- use of mass media -- radio and video cassettes are promising adjuncts to face-to-face extension. They are an effective, low cost way of transmitting agricultural information to farmers, and are particularly useful with illiterates. Local dialects should be used, and radio messages should precede visits from extension agents. Videocassettes can also be useful training tools, especially for low resource farmers. Viewing by farmers' groups is particularly cost-effective.

(4) Appoint Subject Matter Specialists (SMS's) with special responsibility for rural women. SMS's can serve particularly useful functions. They can diagnose women's activities and constraints, stimulate appropriate research and technology, develop recommendations, organize women's contact groups and broaden the technical training of extension agents to cover women's activities.

(5) Improve the appropriateness of the messages and technology for women farmers. An extension system is only as good as the technology offered. To develop messages and technology to better meet the needs of women farmers in Africa, the following are recommended:

- Identify the information and technology needs of women farmers by collecting information on women's farming activities to identify the needs, constraints and objectives of women farmers. Gather such information from three main sources: baseline socioeconomic

and agricultural data, disaggregated by gender; farming systems research or similar approaches; and feedback from extension.

- Develop the linkage with the research institutions to ensure that the research agenda covers farming activities of women, and that technologies are developed to meet the needs of women farmers. The scope of the research should include crops and livestock produced by women, technologies and farming systems suitable to the circumstances of women farmers (such as alley cropping), technologies for water and fuelwood collection and use, and food processing, preservation and storage.
- Design tools and machines suitable for women. These should be portable, inexpensive, multi-functional, suited to women's size and strength, and have use patterns compatible with other activities. To the maximum extent possible, they should be produced locally.
- Improve the availability of new tools and machines, using women's groups as the channel for distribution wherever possible.

CHAPTER 1. THE NEED FOR GUIDELINES ON AGRICULTURAL EXTENSION FOR WOMEN FARMERS: WHY WOMEN FARMERS NEED HELP

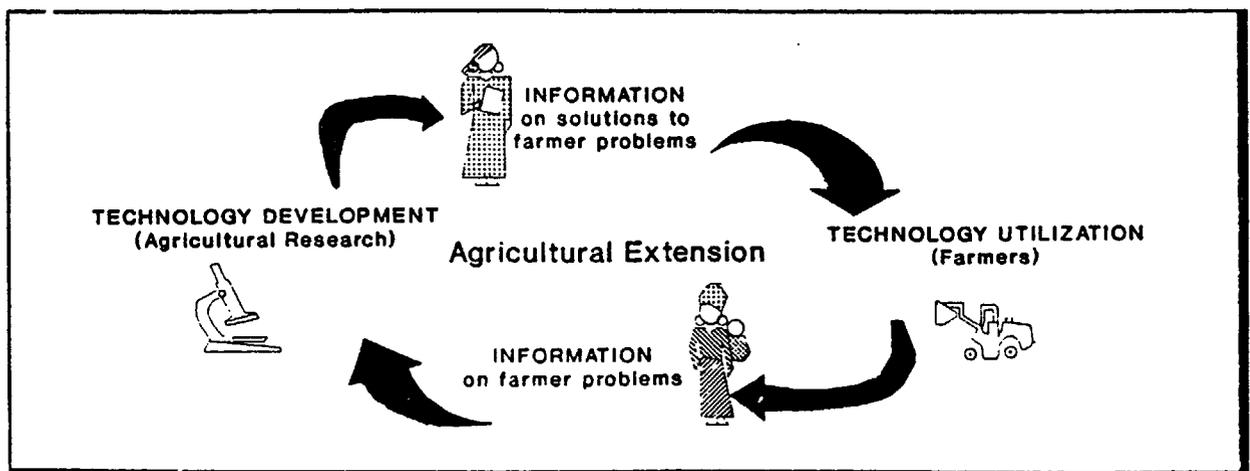
1. Extension's Importance in Agriculture

1.01 Agricultural extension is a prerequisite for widespread and sustained agricultural development. But agricultural extension alone will not increase farm productivity. To be effective it needs a steady flow of relevant information and must be combined with a number of other factors -- land, inputs, labor, credit, markets, and appropriate pricing policies. While the role of extension is complementary, it is, nonetheless, crucial. In fact, where the other factors of production are readily available, its impact can be considerable. Where they are weak, they need to be strengthened simultaneously with extension. For this reason, in 1988 the World Bank introduced the new "Africa Agricultural Services Initiative," a massive effort to improve agricultural research, extension, credit, animal health, input supply, forestry, rural roads and other agricultural services in many African countries.

1.02 Agricultural extension is an educational process with a dual goal: it brings information and technology to farmers and teaches them how to use it to improve their productivity; and it enables farmers to specify their own needs and provide feedback on the effectiveness of extension in meeting them. Through this two-way communication between farmer and researcher, extension services can provide effective transfer of relevant information and technology to farmers. Extension thus provides "the vehicle for increasing agricultural productivity because it links the farmer with the outside world -the scientist, the creditor, and the consumers of his product" (Pickering, 1983).

1.03 Extension has a vital role in ensuring that researchers are aware of problems farmers face. A partnership is therefore needed between the research system which generates technology, the extension agency which transfers technology, and the farmers who use the technology. Extension is most effective when relationships among the partners encourage dynamic, open communication and feedback. Close and regular contact with farmers is obviously essential. Ideally extension transmits problem-solving information to farmers and information on farmers' problems back to the research system. The two-way flow of information is depicted below:

Figure 1



1.04 The World Bank has invested almost \$2 billion in extension in 79 countries since the mid-1960s, with investment rising from about \$1 million per year in the 1960s to almost \$200 million per year in the 1980s. Extension services can be organized in different ways, and various models have emerged. Much of the Bank's investment has been in the Training and Visit (T&V) system of extension, originally used in Asia and now in use in 30 African countries.

Box 1. T&V: SEVEN UNDERLYING PRINCIPLES:

1. A professional service with full-time trained staff supported by resources required to perform their professional functions.
2. A single line of command with staff technically and administratively responsible to one authority.
3. Staff effort concentrated on only the extension function, with staff performing clearly defined, monitorable tasks.
4. Time-bound work and training programs, including regular farm visits.
5. Field and farmer orientation, with special reference to meeting farmers on their own fields.
6. Regular and continuous training at all staff levels to upgrade professional skills.
7. A procedure for ensuring a flow of information between research, extension and farmers (Benor 1987).

1.05 Any extension system must target particular categories of clients to meet their needs efficiently. One lesson to be learnt from the Asian experience of T&V is that training of extension workers should focus not only on the technical message to be transferred -- but also on learning more about "their farmers" and "their farming systems", especially about farmers' behavior and the reasons they do things the way they do. (Cernea and others 1983). This is especially crucial in Sub-Saharan Africa, where men and women within one household can have different resources, motivations, and constraints. Furthermore, face-to-face contact between agents and village-level workers is particularly important when agricultural communities are heavily involved in subsistence agriculture and when large numbers of farmers are illiterate or unfamiliar with current technologies (Pickering 1983).

1.06 Unfortunately, the empirical research on T&V and other extension systems and their effects has been insufficient. Too little is known about collective as opposed to individual adoption of innovations and the role of groups and group-building through extension (Cernea and others 1983). The dynamics of intrahousehold behavior and their implications for extension are also little understood. Consequently, extension staff often lack the tools to fully diagnose the needs and constraints of farmers. This is particularly true with regard to rural women. Agricultural extension was for years carried out primarily by male extension agents -- 1981 97% of extension agents in Africa were male (Swanson and Rassi 1981) -- and directed toward male heads of households. Technological packages were designed with little regard for their likely impact on women's workload, role, and responsibilities.

2. Women's Role in Agriculture in Sub-Saharan Africa

1.07 Almost two decades of surveys and studies have clearly demonstrated the pivotal role of women in agriculture in developing countries.

This is particularly the case in Sub-Saharan Africa where women provide most of the labor and make the key decisions for many agricultural activities. This applies not only to food production, long recognized as primarily a women's activity, but also increasingly to other agricultural activities -- ranging from processing and marketing to cash cropping and animal husbandry.

Case 1: MALAWI "PROFILE OF A WOMAN FARMER"

Sindima, a farmer in Malawi, is in her late thirties. She lives with her five children in an area with relatively good soils and dependable rainfall. Her husband left to find work in the city and she sees him infrequently, so she heads the household, manages the farm, and does almost all the work. She farms about 2-1/2 hectares and is able to feed her family and produce some crops to sell. By local standards, Sindima is affluent. A development assistance program has been active in her village, so she belongs to a farmers' club and has access to the extension agent for information and credit for some fertilizer and improved seeds. With this help, she plants a fairly complicated mix of crops: planting hybrid maize with applications of fertilizer on about one-half hectare. However, she continues to plant local maize even though it is less productive because it tastes better and is less susceptible to insect damage in storage.

Sindima's fields require heavy labor -- with preparation, planting, weeding, and harvesting all timed to keep the land in production as long as the rains last. She also has household responsibilities: caring for the children, grinding maize, gathering firewood, and cooking. She even brews a little beer to sell at the market. Her children help -- the older girls walk to the well twice each day to get water and help search for firewood -- but she can afford to pay their school fees so she encourages them to get an education.

Source: Office of Technology Assessment, 1988.

1.08 Data on the role of women in agriculture in Africa is fragmented, but the International Labor Organization estimates that in Africa 78% of females are economically active in agriculture compared to only 64% of males (Buvinic and Lycette 1988). In Zambia, a random sample of farm households in three provinces indicated that during the farming season women contributed 53% of total hours of labor in agriculture to men's 47% (Due and Mudenda 1984 as cited in Safilios-Rothschild 1985). Studies on Malawi have reported that 50 to 70% of all agricultural work was done by women and 69% of farmers were female (Kydd and Christiansen 1982; Clark 1975, cited in Evans, 1989). In Guinea, women in most regions perform 40 to 50% of agricultural work (Herzog 1988), and an estimated 60% of Gambian women are farmers (World Bank 1988). In Burkina Faso women are responsible for 49% of the labor in crop production. (Tinker 1981 cited in von Braun and Webb 1987)

1.09 Official Underestimate of Female Agricultural Labor. Standard data sources have been criticized for underestimating female workers especially those who are unpaid, and for undervaluing the worth of female-produced goods and services (Dixon-Mueller 1985). In Malawi, for example, official figures showed that only 12% of women were economically active in agriculture in 1972; in 1977 this was revised to 52% (Ewusi 1980 cited in Jiggins, 1986). The fact that women's involvement in agriculture is typically much greater than official figures suggest has enormous implications for the type and extent of the agricultural support services they require.

1.10 Female Heads of Households. A growing phenomenon across Africa is the female-headed household. Definitions of what constitutes a female-headed

household vary, but evidence shows clearly that the number of households managed by women on a day-to-day basis is growing rapidly -- largely because men are migrating to large farms, cities or mines for work. In Kenya, for example, at least 40% of the smallholdings are managed by women (World Bank 1989). Female-headed households are particularly common in the Southern Africa Development Coordinating Conference (SADCC) countries. It is estimated that over half of rural households in Zimbabwe's Communal Areas are headed by women (Skapa 1988), and that women head one-third of rural households in Malawi (Spring 1985). Buvinic and Lycette (1988) report "From one-third to one-half of all rural households are at any one time headed by women in . . . Botswana, Kenya, and Zambia." Available data show that in rural Africa, households headed by women are poorer than those headed by men because they tend to have fewer resident workers, more dependents, and smaller landholdings. They are also much less likely to have access to productive services such as agricultural extension and credit (op. cit., p. 151).

Case 2: NIGERIA: WOMEN FARMERS IN IMO STATE

As C. Ohuegbe, Chief Agriculturalist, Imo State Agricultural Development Project (ADP) has observed, in Imo State women contribute more to food production and family labor than men. It is estimated that over 95% of the rural women are smallscale farmers who produce most of the food and bear the burden of day-to-day family subsistence. According to the diagnostic surveys of the agricultural extension zones, women perform almost all the cultural operations in food production. Such operations as bush clearing, burning, ridge/mound making, planting, fertilization, weeding, harvesting, storage, processing, and marketing are carried out by women. Women also have sole responsibility for cultivating compound farms (or gardens) where continuous cropping is done with household refuse. It was against this background of active participation in food production in Imo State that this ADP decided to give full and adequate technical and financial support to women farmers. (Ohuegbe 1989)

1.11 Improving Women's Productivity. The debate has evolved from the extent of women's participation in agricultural activities to a search for practical solutions as to how to develop agricultural support services that can effectively make women farmers more productive. Given the evidence of women's significant responsibility for and contribution to agricultural production in Africa, one would expect women to be participating fully in developing the extension messages and in delivering those messages to farmers. Yet the evidence shows this not to be the case. Despite a growing awareness of the need to reach women farmers, extension services are still skewed toward males.

1.12 Studies indicate that male heads of household and farmers with access to resources are the primary clients of agricultural support services in Africa (Berger and others 1984). Households headed by women tend to be the least well-served and to have less access to factor and non-factor inputs (Jiggins 1986).

1.13 Communicating with women farmers: why do extension agents (EAs) tend to ignore women? Possible reasons include:

- (a) The EAs' perception that women have little decision-making authority in farming.

(b) Women's heavy workload, which cuts into the time available to meet agents.

(c) Sociocultural and religious factors that inhibit male EAs' communications with women farmers.

(d) The EAs' perception that women have physiological limitations for farming.

(e) The EAs' perception that women are less able to understand most extension messages because of their generally lower level of education (Sigman 1989).

Case 3: MALAWI: WOMEN'S AGRICULTURAL WORK AND ACCESS TO EXTENSION.

Agro-economic survey data show that women farmers in Malawi do 50-70% of the agricultural operations in the smallholder sector, either alone or with their husbands and families. They cultivate food and cash crops in gardens they manage personally or with their husbands. According to the National Sample Survey of Agriculture data, men receive most of the extension visits and training as well as such services as credit, and technical information. (Ministry of Agriculture, Government of Malawi 1983.)

3. Constraints Women Farmers Face: Barriers to Access

1.14 Women farmers generally have more difficulty than men operating effectively in factor markets, if they can get access at all. As a result, most women have less access to and higher effective costs for information, technology, inputs and credit. Their productivity is thereby depressed (Schultz 1988). The explanations underlying these barriers to access relate to child-bearing, time, mobility, education, and an array of socio-cultural characteristics. To design extension services so they effectively help women farmers, it is essential to understand the nature of the special constraints women face and the implications of these constraints for extension.

(a) Land Availability and Tenure.

1.15 Land availability and tenure is a problem for women because they tend to have less secure tenure, land which is more fragmented, or simply smaller plots. Women's relatively less favorable access to land can be a strong disincentive to adopting new techniques or investing in the land. For their part, extension agents may be reluctant to work with distant plots. In developing extension messages, agents should keep the following points in mind:

- (i) Plots allocated to African women are frequently far from their villages and far from other plots the woman cultivates.

1.16 Women's labor productivity is reduced and their time management

problems are magnified when their holdings are geographically dispersed¹. They need more time to commute between plots, and must transport tools, inputs or harvested produce longer distances. Child care is particularly difficult when fields are far: women must decide whether to take their children to the fields or make other child care arrangements. As a result, women may simply not have the time to travel to distant fields to carry out recommended extension practices. This not only reduces women's yields through diseconomies of scale, but causes extension agents to dismiss women as non-adopters.

(ii) Women tend to be over-represented among farmers with little land.

1.17 In Kenya 40% of smallholders¹ are managed by women, and women provide some 75% of the labor on all smallholdings (World Bank 1989b). In Botswana, female-headed farm households work fewer acres of land, have less farm equipment, and own fewer cattle and small stock. (Kossoudji and Mueller 1981). When the land owned cannot support the family, outside income must be sought. A common source of such income is selling one's labor to others. However, this significantly reduces the time available to work on one's own farm. The result is lower productivity for the smallholder and less likelihood of interaction with extension agents in one's field.

Case 4: MALAWI: VICIOUS CYCLE OF SMALLHOLDER AGRICULTURE

In Malawi, 50% of small farmsteads (less than 1 ha) are headed by women. Some 83% of the smallholders consume all their own maize supplies before the new maize is ready for harvest. The shortage of food results in calorie deficits precisely when energy demands are highest -- at the beginning of the rigorous planting season. These smallholders frequently sell their own labor to buy food. Children often fall ill from malaria and food shortages at this time, resulting in additional burdens. Because these small holders sell their labor and have less time to allocate to their own farms, early maize weeding is delayed, significantly reducing yields. The cycle of maize shortage then repeats itself next season. Unfortunately, the number of smallholders caught in this series of events is increasing with population growth and limited off-farm employment opportunities (Carr 1989).

Case 5: COTE D'IVOIRE: EFFECT OF EXPANDING CULTIVATION OF COCOA AND COFFEE

As a result of the expansion of cocoa and coffee, better quality forest zone land, previously planted with food crops, was now planted with coffee and cocoa. Thus, the conditions under which food crops were grown changed: (1) they were grown on poorer quality land further away from the village; (2) because coffee and cocoa are permanent crops, the rotation possibilities were reduced; (3) food crops grown were those which could be interplanted with coffee and cocoa and (4) were those not needing care during peak coffee and cocoa operations. A reduced range of food crops was suitable for these new conditions, and there is evidence that at certain times of the year farm families had insufficient food. The seasonality of income from cocoa and coffee resulted in financial bottlenecks at certain times of the year. During such times, women were obliged to sell part of their food crop production, even though total food crop production was insufficient for two-thirds of the families surveyed. Food crops had to be bought later at higher prices. (Kranz, Jutta and Fiege, Karen, 1984)

¹ Defined as having less than 1 hectare of land.

(iii) Women are less likely to have secure title to land

1.18 In most African countries, land title is in the name of the male head of household. This reflects cultural and sometimes legal conditions. In Zimbabwe, for example, only since 1982 have women been able to legally have land title in their name. This discourages their participation in agricultural support services, particularly extension and credit. In some countries, land ownership is a requirement for contact farmer selection under the T&V system. This clearly reduces the odds that women will be selected as contact farmers. Moreover, in most countries, title to land is required collateral for obtaining credit from formal lending institutions and sometimes also from cooperatives. Thus women's insecure access to land makes it harder for them to obtain the credit they may need to fully implement extension advice.

(b) Lack of Technology

1.19 Lack of suitable farm and household technology impairs women's efficiency, restricts their time, and saps their energy for participating in extension and other development programs. Schultz (1982) has pointed to the need in Africa for organized research centers to do for household technology what agricultural research is doing for agricultural production activities. In parts of Somalia, for example, women spend an average of 8 hours a day collecting fuel and water, 4 hours on food preparation and 2 hours on household chores. Only after 14 hours spent completing these tasks do the women have time for their own farming activities or extension programs (Woods 1989). It is not surprising that, when asked how projects can best help them, a common request from African women farmers is for technology to reduce the labor needed for processing agricultural output.

1.20 Technologies to improve crop production are also lacking for smallholders in general, and for women in particular. The use of animal traction can substantially reduce the demand for women's labor. In Zambia, for example, weeding -- a major women's task -- can be performed six times faster with animal traction. Animal traction can double or triple rates of return by freeing up labor (Allen 1984). Although animal traction is increasingly used, especially in East Africa, the high cost of buying animals and equipment deters many low-resource farmers from adopting (OTA 1988). For resource-poor women farmers the cost barrier is compounded by the additional obstacle of cultural traditions discouraging women's use of animal traction. Despite the initial doubts of their husbands and the male extension specialists for animal traction,

Case 6: GAMBIA: WOMEN'S TECHNOLOGY AND PRODUCTIVITY

In parts of The Gambia, women's labor productivity in individual farming has been estimated to be consistently 70% less than men's. This is due, in part, to the fact that women tend to grow crops with technologies that result in lower net returns to their labor time. But women also exhibit lower average labor productivity levels than men for the same crop and broad technology groupings. These differences are partially explained by women's limited access to labor-saving implements and their time constraints which usually result in women cultivating smaller land parcels, causing diseconomies of scale (von Braun and Webb 1987).

women in a pilot scheme in The Gambia were successfully taught to use draft animals on their irrigated rice fields. Women's access to both animal traction and fertilizer, according to that research, is more limited and costly than men's (GARD 1988).

(c) Lack of Credit and Inputs

1.21 Women are bypassed by formal credit systems for a number of reasons -- lack of collateral (usually land title); need for a male co-signer; lower levels of literacy, numeracy, and general education; lack of information; distance and cost of travel to credit institutions; and the small scale of many women's operations.

1.22 It is not so much that formal laws prohibit women obtaining credit, but rather that these factors discourage their access to it. Studies in countries as diverse as The Gambia (Shipton 1986) and Kenya (Maitha 1986) report that few women smallholders obtain credit from the formal lending institutions. Women represent only 7% in Sierra Leone and 6.3% in Malawi of recipients of seasonal loans. (IFAD 1985) Yet women are generally a better credit risk than men. Women have higher repayment rates than men, not only in Africa but throughout the world, as the examples of the Grameen Bank in Bangladesh and the Rural Farmer's Scheme in Uganda demonstrate.

1.23 Available credit is often limited to the production cycle (while women are often engaged in processing) and sometimes to export crops (which women are less likely to grow). Over half of the women interviewed in Meru and Maranga areas in Kenya (World Bank 1989) said "lack of cash" kept them from using more improved varieties of seeds, fertilizer and other inputs. Payment of wage labor also requires cash, often at a time when low-resource farmers are unlikely to have ready cash or access to credit. Farmers who cannot afford inputs and who cannot pay for hired labor are less likely to be interested in extension activities; likewise, extension agents are less likely to target this group because of their inability to respond to recommendations to purchase inputs and additional labor.

Case 7: ZIMBABWE: MOBILIZING CREDIT FOR RURAL WOMEN

The Savings Development Movement (SDM) in Zimbabwe is a nongovernment, registered cooperative which provides advisory, supervisory, material, and technical assistance to savings clubs for over 200,000 women, most of whom are self-provisioning farmers. Groups of women meet weekly. Each member is expected to save a small amount. But many save more than the minimum. Many of the clubs use their savings for bulk purchase of inputs for maize farming and for bulk marketing of output. The SDM also provides technical packages for smallholders, adapted to various agroclimatic conditions. Once groups are well-established, they go on to larger scale activities such as producing cash crops on group plots (FAO 1984).

1.24 Without credit, women are less likely to be able to afford the inputs recommended by extension agents. This can, in turn, lessen their chances of having contact with extension agents. In the early days of the MIDENO project in the Cameroon, for example, extension agents made more visits to the farms of those who purchased inputs than to those who did not, and men were more likely than women to be purchasing inputs. (Koons 1989). This situation was corrected later in the project when women's groups were used as

a contact point for providing inputs through in-kind credit arrangements (Walker 1989).

1.25 When their access to formal financial institutions is limited, women tend to rely on informal credit systems, including traditional credit/savings societies--such as tontine and esusu groups--merchants, moneylenders, relatives, and friends. Rural women's demand for credit is strong, judging from the fact that they are willing to pay many times the market interest rates for informal credit.

**Case 8. MALAWI: WOMEN FARMERS'
LOWER FERTILIZER USE**

In Malawi's Phalombe Rural Development Project, 33% of male heads of household and only 15% of female heads of households applied fertilizers; these were usually farmers with above average size holdings (Evans 1989).

1.26 The problems of providing credit to rural women are not insurmountable. In many countries schemes are underway with innovative approaches to overcoming the collateral problems - for example, using the joint pledging of a group, like with Grameen Bank in Bangladesh, the mobility and time problems - for example, through using mobile banking units and more flexible hours of operation, and illiteracy - for example, using a bank card with colors for units of saving/credit corresponding to different bank notes, as with the credit scheme operated by TOTOTO, an NGO in Kenya.

(d) Lack of Mobility and Time

1.27 Extension agencies also need to consider that women tend to be less mobile and have less uncommitted time than men. The time and energy involved in providing the family with food, fuel and water leave little time to participate in regular extension programs and inhibit women's ability to respond to opportunities. Women's dual roles and the relative inflexibility of domestic chores, such as family meal preparation, require that extension planners consider carefully the timing and scheduling of extension contacts to allow more women to participate.

Box 2: WOMEN'S TIME USE

Studies of time use in rural Africa indicate women are likely to have fewer leisure hours than men. Research in Burkina Faso reported that men averaged twice as much time resting and relaxing each day as women (McSweeney, 1979). The same study reported that women contributed almost as much time per day to food and cash crop production as men. Women did virtually all winnowing, threshing, food processing, and fetching of water. Men spent more time on community obligations, crafts and other professions, and listening to the radio or reading. A 1987 time allocation study in one Gambian village reported that women performed 53% of agricultural and 73% of domestic work compared to 33% and 6% respectively for men. Women were responsible for 58% of the total village time allocated to productive activities compared to 25% for men and 17% for children (Bastone 1987). In Bandundu, a principal agricultural region of Zaire where cassava is the main crop and women are the dominant farmers, women spend one-third of the day processing and preparing food (Eele and Newton 1985). Available data in Kenya indicate women spend one-third of working hours on food preparation and child care which stretches their working day to 13-14 hours. Most of them spend three hours a day fetching water. (World Bank 1989)

1.28 Women are also less mobile, because they have less time, less cash for transportation, and less likelihood of owning transport. In some

countries, sociocultural and religious barriers limit their mobility as well. This limits their ability to attend training courses outside their villages. Mobile extension training courses can overcome these barriers. In Zambia, mobile training increased the numbers of farm women in extension training to about one-third of participants (Safilios-Rothchild 1985). Extension courses which use decentralized centers can also provide transportation, day care, and residential facilities for women or break courses into several shorter modules.

(e) Lack of Education

1.29 Throughout most of Sub-Saharan Africa, the adult male literacy rate is almost twice that of females. Males are almost twice as likely to be enrolled in secondary school. Moreover, gender-based educational discrepancies tend to be greater in countries where incomes are lower or where Islam is widely practiced.

1.30 In its study of extension for women in five African countries, FAO (Gill 1987) reported that the vast majority of rural women were illiterate. Percentages of rural women unable to read or write were available in four of the countries:

<u>Country</u>	<u>% of women unable to read and write</u>
Kenya	30
Malawi	68
Sierra Leone	94
Zimbabwe	30

1.31 Women's access to agricultural extension and their ability to comprehend and use technical information is compromised when they lack basic education. Studies supported by the World Bank have demonstrated the critical link between farmer efficiency and farmer education (Jamison and Lau 1982). The impact of education on efficiency is likely to be particularly strong when modern as opposed to traditional agricultural techniques are being introduced.

Box 3. EDUCATION AND FARMER PRODUCTIVITY

Lockheed, Jamison, and Lau (1980) examined 18 studies consisting of 37 sets of farm data. Controlling for other variables, they estimated the effect of education on farmer efficiency. They concluded that farm productivity increases an average 7.4% if a farmer completes four years of elementary school.

One of the few studies to compare the efficiency of female and male farmers concluded that both male and female farmers in the Vihiga Division of Western Kenya achieved higher maize yields when they had four or more years of education. (Moock 1973)

1.32 This has implications for how extension messages are delivered. Because of their lower level of education, women are less able than men to respond to written extension materials. Other forms of communication are

needed, particularly oral or visual. Moreover, the ability to read and write is a criterion for the selection of contact farmers in the T&V extension system in some countries in Africa. For women to fully participate in extension activities, this requirement must be changed.

1.33 Measures to compensate for female illiteracy in providing extension services are suggested in Chapter 3, Section 7. In the longer term, increasing school enrollment of girls will help boost the productivity of female farmers. But effective extension services can also help narrow the productivity differential between more and less educated farmers, as a number of studies (including Schultz 1988) show.

Case 9. CAMEROON: EXTENSION AGENTS AND WOMEN FARMERS

In the early stages of the MIDENO project in the Cameroon, extension agents were encouraged to meet with farmers' groups but individuals could also request that Extension Agents (EAs) visit their farms. Also, farmers who purchased inputs were often visited. Analysis indicated that farmers who experienced farm visits and group meetings understood the recommendations better and were more likely to adopt them than those who only attended group meetings. Although assistance was supposed to be the same for men and women, men in the survey received eight times more individual farm visits than did women. Male farmers had little reluctance to ask for farm visits. Women believed their farms were "too small," "too poor" or "too far away" to rate a visit. Many women indicated that they did not think they could or should ask for a visit. Others thought visits were reserved for farmers who purchased inputs, something which fewer women did than men. For their part, the EAs concluded that women did not ask for visits because they were not interested. It was evident that the strategy of asking farmers to step forward to request visits was not as appropriate for women as for men (Koons 1988). The situation improved under later project initiatives for expanded extension delivery to women farmers. (Walker 1989)

(f) **Sociocultural Factors Affecting Transmission of Information**

1.34 In most countries, cultural norms circumscribe male-female interaction. These tend to be more restrictive in rural than urban areas, and in traditional than modern societies. In Islamic countries, prohibitions tend to be more rigid. These norms may or may not be codified into law. Sociocultural factors affect extension on two levels -- that of agent to farmer, and of male farmer to female farmer.

Case 10: NIGERIA: EXTENSION DIRECTED TO MEN

Diagnostic surveys in Imo State revealed that although women make a major contribution toward increased food production in Imo State, they hardly benefited from extension services. Their needs were seen mainly in terms of home science - sewing, clothing, cooking, and child care. The extension service directed new technology to men and tended to hold meetings, demonstrations, and training in locations that are inconvenient for women farmers. (Ohuegbe 1989) As a result of these findings extension services in Imo State were radically changed to ensure a more effective service for women farmers. (Okoro 1989)

1.35 **Extension Agent-Female Farmer Interaction.** In some countries, the gender of agricultural agents does not appear to be an overriding issue. In many African countries, it does make a difference. Even where women have equal legal status, rural women may be shy and reluctant to speak up in extension meetings in the presence of male agents or men from the same village. Women lack confidence because of lower educational levels and less contact with the outside world. Men are seen as authority figures whose

decisions are to be followed. Male extension agents, raised in the same cultural traditions, often expect women farmers to follow their directions and do not encourage their questions (Krogh, 1988; Evans 1989). These problems can be relieved by arranging for women farmers to meet in separate groups and, where possible, to have female agents work with them.

1.36 Intrahousehold Transfer of Agricultural Knowledge. Development planners have assumed that information given to male farmers will be passed along to other farming members of the household. This is not often the case. Experience indicates that agricultural knowledge acquired by males often does not "trickle across" effectively to females in the family (Fortmann 1978; Spring 1985). Men are usually not expected to share their information, especially in a polygamous household. It would be improper for a wife, especially a junior wife, to query her husband about what he learned from the extension agent that day.

Case 11. BURKINA FASO: EXTENSION INFORMATION BYPASSES WOMEN

A village livestock project in Burkina Faso failed because the information and resources to improve the production of small livestock were directed at men, although women were responsible for most of the small livestock (sheep, goats, and poultry). The assumption that resources and knowledge about small livestock would "trickle" from men to women did not hold. The women did not receive the resources they needed to improve their livestock production. (Carloni 1987)

1.37 Men are less likely to pass information along to women when crops or tasks are gender-specific, which is the case in much of Africa. In Malawi, for example, wives of agricultural extension group members said their husbands rarely passed advice on to them. If they did, the women had difficulty understanding the advice secondhand or did not find it relevant to their needs (Evans, 1989). Even if men were willing to teach their wives, they may simply not be familiar enough with an agricultural operation or crop to effectively transfer the information.

Case 12. KENYA: THE RELATIVE EFFICIENCY OF FEMALE AND MALE FARMERS

A study of the relative efficiency of female and male farmers concluded that in the Vihiga Division of Western Kenya, maize yields for women small holders were 7% more than for men with the same access to extension, land inputs, and education. (Moock 1973)

Conclusion: What to Do?

1.38 What do these gender-related constraints mean for agricultural extension? For extension services to help women farmers effectively, they must reflect consideration of the particular constraints women face. There are cost-effective ways of doing this; they entail the following:

- (a) an analysis of the constraints, circumstances and agricultural activities of women farmers, and use of the knowledge and understanding gained;
- (b) an improvement in the provision of support services, particularly

the methodology of the transmission of the extension messages; and

- (c) an improvement in the appropriateness to the female farmer of the technologies generated and the messages developed.

1.39 Many African countries are experimenting with different ways to provide extension services that overcome these constraints. We need to learn from this experience -- what works and why, and what does not work and why -- to replicate these approaches elsewhere. It is worth the effort; without doubt the potential payoffs to improving women's access to resources and information in terms of increased output are substantial. The Bank has a special role in this effort, and an important opportunity to push for experimentation.

Summary

Women are disadvantaged with regard to factors of production because, compared to men, women tend to:

- have farm fields which are smaller, more dispersed and less secure in tenure
- lack technologies appropriate for women's activities
- be bypassed by formal credit systems (which impose restrictions unrelated to ability to repay, and which tie credit to specific activities and crop cycles)
- use fewer inputs and less animal traction (due to lack of credit)
- be less mobile and have less uncommitted time (due to family and household responsibilities, and to a wider range of agricultural activities)
- be less educated and have less contact with the outside world

Women tend not to receive, directly or indirectly, help or advice from the extension service due to the inhibiting effect of sociocultural factors:

- cultural norms may restrict male-female interaction
- traditionally men are seen as authority figures and so women lack the confidence to speak at mixed meetings or to make their own decisions
- men are not expected to share information with their wives and it would be improper for wives, especially younger ones in polygamous households, to query the husband about what he learned from the extension agent

These physical, economic and social constraints result in relatively low productivity of women's labor and of women's fields (individual and communal), and in a consequent loss of potential agricultural production.

Although there is now an awareness of the need to reach the increasing numbers of women farmers - who on a day-to-day basis manage rural households -- agricultural support services are still skewed towards men. The particular constraints of women farmers need to be considered when technologies are being generated, messages developed and extension methodologies formulated.

CHAPTER 2: MODIFYING EXTENSION TO REACH WOMEN FARMERS: INFORMATION NEEDS

2.01 Accurate information is the fundamental factor underpinning the improvement of extension services to women farmers. Accurate assessments of the financial and social benefits of the goods and services produced by women and of the loss of potential benefits if women farmers continue to be neglected, are needed to convince policymakers and planners of the importance of initiatives to help women farmers. Knowledge and understanding of women farmers -- what they do, how they do it, why they do it, and why they don't do something else -- is essential if the research and extension services are to produce and deliver technical advice that is needed by these farmers and is appropriate to their circumstances. This chapter examines the range of information needed to develop, monitor, and evaluate an extension program for women farmers, and describes ways of collecting such information.

1. Understanding Women Farmers

2.02 Characteristics of African Households. Households in Sub-Saharan Africa should not be viewed as a single profit-maximizing unit with one set of objectives, but rather as a group of interdependent people with separate responsibilities and income streams and with resources allocated according to different preferences and needs.

2.03 This has important implications for identifying the extension messages that farmers want. Such messages can be identified, developed, and indeed delivered only if there is an understanding of who is doing what, with what, on the farm. Extension staff need to compile information on the farming population in their area and use this information to diagnose who is carrying out different farm activities and under what constraints.

2.04 Household Obligations by Gender. In many African societies, women use income from their own crops to meet a variety of household and personal expenses. For their personal fields and household crops under their charge, women must often pay for production inputs, hired labor or food for reciprocal labor groups. Women must also provide a variety of goods and services for the household -- particularly food, clothes, and medicine for themselves and their children. Men tend to be responsible for housing, taxes, production inputs and labor hired for their own crops -- and at least part of school fees and ceremonial and religious obligations.

2.05 Women's agricultural activities have tended to be undervalued in agricultural censuses and project baseline studies, resulting in incomplete, inadequate, or inaccurate information about women farmers. Such data, when used to design extension activities, has deprived women farmers of needed information and inputs. Jiggins (1986) notes that "what is measured is determined by researchers' fields of observation and perception of what it is important to record. For example, the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) decided not to record backyard production in its village studies, even though one of its mandate crops, pigeonpea, is an important backyard crop."

Box 4. COTE D'IVOIRE, TOGO, AND BURKINA FASO. INCOME FROM THE "FAMILY FIELDS"

Although women now contribute more labor to the production of cotton on "family fields," men retain control over the income from cotton, and women have lost income from their household plots since they could not spend as much time on them. Reduced access to the household plots affects the financial status of the women and their daughters -- these fields often provide income for school fees, clothing, medical supplies, and food for household consumption. Such fields are often important to the survival of polygamously married women and their children in the dry season, when the output from the family fields is exhausted. Loss of income from this source has not been made up by revenues from the family fields. Women report that they derive no income from the family fields, the proceeds of which are often allocated by the household head to the purchase of another wife, a mobylette or a radio. In Burkina Faso, which has a high incidence of polygamy, the introduction of cotton has reportedly contributed to a rise in polygamy. A recent survey has shown that mechanized producers have an average of 2.5 wives; those with animal traction, 2.1 wives; and manual cultivators, 1.7 wives. Women have had to make up the loss of earnings from their household plots by secondary activities. The survey shows that almost all activities that yield supplementary household income are undertaken by women, for example, processing of groundnut oil, karite butter (65%), beer (32%), while revenue from individual fields accounts for 26%.

Source: World Bank, OED 1988.

Case 13: NIGERIA: THE INVISIBLE WOMEN

Sometimes women are invisible to untrained researchers or enumerators and excluded from extension services. Northern Nigerian Muslim women in seclusion are not often seen in public, especially by unrelated males. This does not mean they are economically inactive, however. A number own land, hire laborers, use overseers to help manage their farms, and make agricultural decisions, and all are engaged in some form of agroprocessing. Analysis of agricultural activities of women in this region led to their inclusion in extension activities (Weidemann 1987).

Case 14: BOTSWANA AND SIERRA LEONE: THE INVISIBLE WOMEN

Because of the marked spatial separation of arable and livestock farming and strongly sex-specific allocation of farming responsibilities and tasks in Botswana, it has been possible to estimate the relative investments to and returns from male and female farming (Fones-Sundell 1984). Analysis of 1984 production data shows that although women contributed almost 70% of the value of arable production, they benefitted from less than 15% of government expenditures on that subsector, including extension.

A project formulation mission undertaken in 1979 by the FAO/World Bank Cooperative Program in Northern Sierra Leone failed to identify in its data collection, analysis, or presentation, the preponderant role of female rice farmers and traders in several of the northern chiefdoms. In fact, about 80% of small rice traders in these areas are women (FAO/World Bank 1980).

2.06 Gender Roles in Agriculture. Distinct divisions of labor by crops, livestock and farming operations exist in most African countries. This may differ for a single crop depending on whether it is grown as a household or personal crop. In many cases, men and women have complementary roles for the same crop. In the production of irrigated rice in The Gambia, Senegal, Mauritania, and Burkina Faso, for example, women specialize in transplanting, weeding, winnowing, harvesting, and threshing, while men perform other operations, such as paddy preparation and irrigation maintenance (Dey 1983). With regard to livestock, although divisions of ownership vary, there is a tendency for men to own cattle and women to keep poultry, goats and small ruminants.

2.07 Agricultural roles do not always follow expected patterns. The generalization that women produce food crops while men engage in cash cropping does not always hold. Women tend increasingly to do both, and food crops can also be marketed. As women seek income-earning opportunities to supplement their own production, they are taking jobs as hired labor on larger farms and engaging in cash cropping -- for example, in Malawi and Zimbabwe. Gender roles in agriculture can also change in response to relative returns to labor. There is considerable evidence, for example, that when a new technology makes an activity more profitable, men will take over the activity. A case in point was in The Gambia, where the introduction of irrigation turned swamp rice from a women's to a men's crop (von Braun and Webb 1987).

2.08 Control over Resources. While it is important to generate gender-disaggregated data on the work performed by household members in designing agricultural extension programs for women, it is equally important to know who owns or controls factors of production, crops, or income derived from the sale of produce. Extension planners need to understand that women are most likely to invest time and resources in production when they retain control of the harvested crop.

Case 15: CAMEROON: CONTROL OVER RESOURCES AND HOUSEHOLD BARGAINING

The issues of control over resources and the conflicting interests of men and women have been documented in a study of rice production in the Cameroon. This study found evidence of allocative inefficiency in household production decisions that resulted in suboptimal production of the cash crop and failure to maximize income. This could be explained by the compensation women received for their labor. Revenues from the sale of rice were traditionally controlled by men, although women were expected to contribute their labor. Women derived income from the sale of subsistence crops, the returns for which were considerably lower than for rice. Wives were willing to work on rice only when they were compensated for their labor according to the market value of their product, or at least well above what they could expect from subsistence crops. Otherwise, they chose to work on subsistence crops even though this kept the family's total income below the potential maximum. This demonstrates that it is mistaken to assume the traditional "unitary household" -- but rather, that the bargaining model, reflecting who controls what, may be more appropriate. It also indicates the potential cost to productivity of denying women the fruits of their own labor (Jones 1986).

2.09 Types of Women Farmers. Data are needed on which women are farm managers in their own right, farm partners with their husbands, or laborers, because the extension information and resources needed vary for each type. Women in the farm partner/worker and farm manager categories should receive extension services based on their responsibilities in the farm enterprise. Extension should certainly reach female-headed households since this group is often over-represented among the poor and disadvantaged. Female agricultural wage laborers, who may be landless, have little decision-making power and need not be primary extension targets.

Type of Farmer

Implications for Extension

Women as Farm Partners or Workers

Men and women responsible for separate crops/livestock

Information on women's crops, especially food crops (for both consumption and sale) and other women's activities should be included in technical messages.

Men and women produce the same crops but in separate fields.

EAs should visit both women's and men's fields.

Separate tasks assigned by gender during the cropping cycle or for livestock care.

Technical messages should also be developed for women's tasks and delivered directly to them, not through the male farmer.

Men and women undertake the same tasks on the same crops/livestock.

Technical messages should be given to both men and women.

Women as Farm Managers

Women-managed farms where men are temporarily away or rarely present.

Agricultural support systems, including extension, must recognize women as primary decision-makers and deliver services to women farm managers.

2. Collecting Information on Women Farmers

2.10 Diagnostic Data. To determine what extension messages female farmers need, extension agents should collect both quantitative and qualitative information on women's cash and subsistence agricultural operations, the constraints women face, their access to resources, and their control over income. To understand the importance of gender in the farming situation, researchers should use a combination of methods, including farming systems research, such anthropological techniques as unstructured surveys, and direct observation by social and biological scientists.

Case 16. MALAWI: COLLECTING AND USING DATA TO PLAN WOMEN'S EXTENSION SERVICES.

The Women in Agricultural Development Project (WIADP) is an extension project that diagnosed the needs of women farmers and designed appropriate services based on these needs. The project was an "add-on" component to a farming systems project the original design of which had overlooked these issues. The purposes of the project were to:

- a. Collect and disseminate research data on women's contribution to smallholder agriculture in terms of labor and output.
- b. Establish mechanisms to collect gender-disaggregated data and to pinpoint whether or not problems were gender related.
- c. Provide farmer-managed demonstrations and trials, credit programs, leadership training, and workshops to retrain WIADP staff.
- d. Develop workable strategies that implementation teams could use to reach women farmers as client groups.
- e. Design formats to monitor participation in extension services by gender.
- f. Involve women farmers in the planning process.
- g. Legitimize the male extension staff's work with female farmers.

The study showed that: (1) women were becoming full-time farmers as men became part-time farmers; (2) women spent as much time on farm work as on domestic activities and did as much farm work as men; (3) labor and cropping patterns varied by locality but women were involved in all aspects of farming; (4) the number of female-headed households in rural Malawi was increasing to approximately one-third, mostly because of male migration, and (5) women were interested in agricultural development services but were handicapped by delivery services.

The study also showed that when women are given the opportunity to receive credit, agricultural training, and inputs, their agricultural performance is similar to the better male farmers; and women who receive inputs and instruction manage their farms as well as men, obtain similar yields, and practice crop diversity. These women make good use of credit and rarely default on loans.

The WIADP staff analyzed the data from the Malawi National Sample Survey of Agriculture and found that male farmers received more personal visits and advice than women farmers did. Data were then disaggregated into three categories: male household heads, female household heads and wives of household heads. Results indicated that men received more extension services than women. Often wives who were farm partners received more services than female household heads--but few wives received agricultural information from their husbands.

WIADP conducted two experiments to determine: (1) whether male extension agents could work with women farmers and (2) whether women farmers could do on-farm experimental trials with precision. The answers to both questions were affirmative. As a result, the WIADP prepared an extension circular, distributed by the Ministry of Agriculture, describing techniques with which male extension staff would improve their contact with women farmers and to include more women farmers in credit, training, demonstration, and visitation programs (Spring 1985).

2.11 It is important to speak with the women farmers themselves or the planned extension activities may not be targeted appropriately. Questioning men is unlikely to elicit the full extent of female farming activities since men tend to understate their wives' roles. Indeed, men may be unable to answer accurately because they may not know the true extent of tasks in which they have not directly participated. Moreover, responses should be verified by direct observation because women sometimes downplay their own agricultural roles for status reasons. All enumerators require special training in the nuances of collecting data on women farmers and it may be necessary to use female enumerators.

2.12 Recommended Methods for Gender Analysis. Certain data collection methods have been effective in planning services for female farmers. It is

unnecessary to use all of these methods. Rather, each agency should identify its minimum data needs on female farmers and select appropriate methodologies from the following list:

- Agricultural calendars, citing activities by month and indicating the gender and person responsible. These should include important cultural events, such as male initiation ceremonies, which influence who does the work and when.
- Spatial maps, a geographer's tool adapted by other researchers to visually describe a system. Symbols such as R (indicating who is responsible), L (who provides labor), and C (who controls the resource) can be attached to maps of fields or enterprises. By mapping responsibilities in each field, a clearer picture of constraints, participants, and beneficiaries emerges.
- Seasonal labor profiles, representing seasonal labor tasks and estimating personal days per month allocated to each task during an average farming season. These profiles are extremely useful in showing changes in the farming cycle and labor allocation when new crops or techniques are introduced.
- Informal surveys, popularized by farming systems research, include Rapid Rural Appraisal and rural reconnaissance. These are quick, informal, cost-effective ways to describe farming practices, agricultural knowledge, and women's roles in agriculture.
- Group and community interviews, which can be conducted with a group of individuals representing more than one household. These can yield a quick, inexpensive overview of conditions and practices in an area.
- Community portraits, which easily compiled for a variety of project village. These allows one to compare and contrast beliefs and practices across villages.
- Household record keeping is useful for determining family labor contributions for carefully selected, representative households. The technique can be used in non-literate societies by substituting pictures for various activities.
- Policy inventory techniques give an overview of recent sectoral performance, listing major policies affecting the sector and assessing policy impact -- for example on women engaged in agriculture.

2.13 Rapid Cost-Effective Techniques. Several rapid yet inexpensive methods have been used successfully to diagnose and plan extension programs for female farmers in Africa. One such technique is the informal survey technique of Rapid Rural Appraisal combined with a two to three day field visit to the project area. Site-specific information on female involvement in agriculture can be obtained by questioning local officials and extension agents, especially female agents or home economists. Another useful technique requiring only a few hours is to gather groups of women farmers--preferably without the inhibiting presence of their husbands and other male authority

figures--and ask key questions about their agricultural operations and the problems they face. Indirect questions, about which family members are overextended during various agricultural operations, are helpful in gaining an understanding of where women need assistance (McKee 1986). Onetime surveys and T&V Monthly Technical Review Meetings also provide rapid low-cost data on African women who farm. A more elaborate survey design using a larger sample and random selection would allow the results to be generalized.

Case 17: CAMEROON: INEXPENSIVE SINGLE QUESTIONNAIRE

Farmers displayed an impressive ability to recall the details of their farming operations. A single questionnaire, administered to each married adult in a random sample of forty rural households, was used to estimate annual production and labor time. Results from this survey were within 7% for men's annual cocoa production hours and 11% for women's annual food production hours, of results obtained using daily interviews throughout the calendar year (Henn, 1988, p. 318). The World Bank reports favorably on the accuracy of farmer estimates of yield compared to more expensive and time-consuming methods traditionally used by research teams. (Verma, et al, 1988)

2.14 Another important and readily available indicator of the magnitude of women's agricultural responsibilities is the off-farm employment rates of men. When more men work off-farm, women are more likely to be active farmers and key decision-makers in farming activities. Extension can then be adjusted to target women more directly.

Box 5: NIGERIA: DIAGNOSING OF GENDER ROLES IN T&V EXTENSION PROJECT

The Imo State Agricultural Development Project in Nigeria uses an excellent yet inexpensive technique for collecting and using data to guide extension delivery on a continuing basis. At the T&V Monthly Technical Review Meeting, staff analyze who in the family is responsible and who provides labor for each new recommendation. Information collected through diagnostic surveys provides useful information for this analysis. This enables extension staff to understand family labor allocation and target women to receive the new information where appropriate. The technique should probably be expanded to include whether and how the proposed recommendations will change labor patterns, incentives, or resource allocation within the family. (Okoro 1989)

3. Monitoring and Evaluating Extension Programs for Women Farmers

2.15 The monitoring function provides managers with feedback on how and how much extension has progressed compared with what was planned. Evaluation seeks to explain and if possible measure the level of efficiency of implementation relative to costs and accrued benefits (Murphy and Marchant 1988). A key indicator of the effectiveness of T&V extension is the adoption rate, which provides immediate feedback about program performance.¹ Adoption should be incrementally measured for women farmers, who more likely than men farmers to be only partial adopters.

¹ For more information about monitoring and evaluation of agencies using the T&V extension system, see Murphy and Marchant 1988.

2.16 Methodology. Current thinking on monitoring and evaluation favors the use of multiple data collection approaches rather than one. Emphasis should be on rapid, cost-effective methods that capture the complexities of African households and the implications for extension of gender differences. Monitoring must be continuous, not perfunctory and intermittent, to ensure that interventions have the desired impact on household labor allocation and income streams. Many of the simple, gender-sensitive techniques outlined above are also useful for monitoring the impact of projects on women. For example, field trip reports by extension and research supervisors can be an effective tool for gender-disaggregated analysis. Such reports should include the following information as a start:

How many people were contacted?
Women ----- Men -----
Whose farms/fields were visited?
Women ----- Men -----
Who received project benefits--inputs, credit, training, etc.?
Women ----- Men -----

2.17 Including such information obliges extension and research supervisors to address the issue of involving women farmers in extension. This approach is much less expensive and time-consuming than extensive surveys and, provided interviewees are selected randomly, the results can be generalized over a larger population. (Russo and others 1989).

2.18 To evaluate the effectiveness of extension projects in reaching women, at least four questions should be asked:

- Is the project attempting to reach women?
- Is the project, in fact, reaching the targeted women (for example, the women farm managers)?
- Are the targeted women benefiting from project activities?
- What effect is the project having on targeted women?

2.19 If the project is a pilot or has innovative features, a mid-term evaluation should be scheduled to adjust its course and to identify features that could be implemented on a broader scale.

SUMMARY

The first step in improving agricultural support service projects is to develop an understanding of female farmers, their activities and circumstances, and of the characteristics of African households. Information is needed on:

- household obligations by gender since this will determine the objectives of men's and women's activities
- gender roles in agricultural activities. Men and women may have complementary roles within an activity, or may have separate activities. Gender roles are dynamic and women are becoming increasingly involved in cash crops production
- who has control over resources: the factors of production, the crops and livestock produced and the income from sale of produce
- types of women farmers. The needs of the women will vary depending on whether they are farm managers, partners or laborers

Collect diagnostic information by direct questioning and observation of women farmers:

- use methodologies such as: agricultural calendars, spatial maps, seasonal labor profiles, informal surveys, group and community interviews, community interviews, community portraits, household recordkeeping, policy inventory techniques
- for rapid cost effective techniques use: rapid rural survey combined with short field visits, group interviews with key questions, one-time surveys, and monthly extension meetings

Monitor and evaluate support services to women farmers by use of multiple data collection methods which are rapid and cost-effective:

- monitoring through gender disaggregation of extension agents' reports: How many men and women contacted? Whose farm/fields were visited? Who received project benefits? Who adopted and to what extent?
- evaluation of the project: Is the project attempting to reach women? Is the project in fact reaching targeted women? Are the targeted women benefitting? What is the effect of the project on the targeted women?

CHAPTER 3: HOW TO REACH WOMEN FARMERS THROUGH EXTENSION:
TRANSMITTING OF THE MESSAGE

1. Agricultural Support Systems in Anglo- and Francophone Africa

3.01 While the extension services in place vary greatly from country to country, and even within countries, it is possible to give a generalized description. In many African countries, extension and agricultural support services are provided by a mix of government and parastatal bodies with, in general, the former predominating in Anglophone and the latter in Francophone countries.

3.02 In Anglophone Africa, the most common system is a national government service based in one of the ministries concerned with agriculture and having the mandate for a wide range of crops and for animal husbandry. The function of the service is to further government agricultural objectives: in the past this meant an emphasis on the production of cash/export products but more recently staple food crops have been included. There has thus been an historic bias against the agricultural interests of women farmers. In some countries, extension for the major perennial export crop (eg cocoa or tea) may be the responsibility of that crop's research institute or of a semi-autonomous organization.

3.03 In Francophone countries, agricultural support services are often provided by single product parastatal organizations. These vertically integrated filières provide seeds/planting material, extension advice, credit, organize input supplies and buy the produce, and then process and market the product. The filières' principal objective is to increase production of the mandated product, and the advantage of the system has been the strong focus on single enterprises. Recently, responsibility of the filières has been expanded to the whole farming system or new filières established to cover food crops. Even with these changes, the other crops/enterprises and inter-relationships within the farming system tend to receive less attention than the primary product. This neglect of the farm as a unit places the female farmer, with her responsibility for food crops and relative non-involvement with semi-commercial farming, at a particular disadvantage.

3.04 The geographical coverage of the filière is determined by the cultivation range of the crop (or livestock). Thus in any area there may be two or more filières operating and advising farmers. With other government and NGO projects, a village may receive extension messages from agents of several organizations.

3.05 In both Anglophone and Francophone countries, donor-funded development or extension projects in the semi-independent support services are superimposed in a patchwork pattern on the basic organization. In the past, these projects often provided broad based services (extension, input supplies and marketing arrangements), but the more recent World Bank funded T&V extension projects have concentrated on extension only. Superimposed on a smaller scale, but very important for women farmers, are many NGO projects.

2. Gender of the Extension Agent: Does it Matter?

3.06 Whether the gender of the extension agent matters in transmitting information to women farmers varies enormously depending on the sociocultural context. In certain Muslim areas it is impossible for a male extension agent to work with a woman farmer; in other areas, women farmers are so eager for extension advice that the agent's gender is irrelevant.

3.07 Evidence from a wide range of African countries demonstrates that communication with women farmers is generally enhanced when female extension agents are used (Evans 1989). This is true even in countries with relatively few social barriers to male-female interaction. In Zimbabwe, for example, where women are legally equal in status to men, more women were found to participate in extension when female agents were used (Skapa 1988). It is always, however, best to enlist the support of husbands and male leaders before embarking on women's agricultural programs of any sort. Otherwise, males may resist supporting programs for their wives until they see direct benefits, as happened in Malawi. (Evans 1989).

3.08 Using more women extension agents does present difficulties. First, how can the supply of women extension agents be quickly increased? Second, if more women extension agents are available, how are they to be integrated into the extension system? How do you get male colleagues to accept and support them, for example? How do you deal with conflicting family responsibilities? How do you ensure adequate logistical support (including transportation) for them?

3. Female Extension Agents

(a) Training and Recruitment

3.09 A 1983/84 study of trained manpower in Africa revealed that only 3% of agriculturally trained personnel working in the public sector in Africa were women and only 13% of students enrolled in agricultural schools were female (FAO 1987). To increase female agricultural enrollment two strategies are proposed: (1) enroll more girls in secondary school since this is the factor most highly associated with female participation in intermediate agricultural training, and (2) implement targeted growth rates for female enrollment in agricultural training institutions by which to set policies, establish guidelines, and determine benchmarks for progress (Sigman 1985). Admission policies of intermediate agricultural institutions should be reviewed to ensure that enough places are available for women and that women are encouraged to enroll. Boarding facilities for female students should be made available, and parents of secondary school girls should be informed of opportunities in agriculture. Entry requirements that are irrelevant to the job but that may constitute barriers to female enrollment should be eliminated. And once in agricultural training, women extension agents must be offered the same curriculum as men.

3.10 Agricultural extension systems ought to accommodate married women extension agents. The practice--common in some African countries--of expelling women extension agents once they marry or become pregnant

discourages women from joining training programs for extension agents and wastes scarce training resources. (Safilios-Rothschild 1985.)

Case 18. ZAMBIA: TRAINING AND POSTING WOMEN EXTENSION AGENTS

The Agricultural Colleges of Monze, Mpika, and the Natural Resource Development College train agricultural extension officers. Until 1982, however, the syllabus used in the two-year agricultural training course was different for men and women. Women were not given full-scale agricultural training and on graduation were placed in the Home Economics Section of the Ministry of Agriculture and Water Development. This was unacceptable to women who wanted to become agricultural extension agents.

According to a 1984 survey by the Zambian Department of Agriculture, female agents represented only 9% of the total number of extension agents in those provinces where the percentage of female-headed households is very high. In the Northern and Luapula provinces for example, only 6% of the extension agents are women, whereas in Lusaka, where the percentage of female-headed households is lower, 24% of agents are women. There is a clear need to step up the training of female extension agents and post them in the field, where they are most needed. (Safilios-Rothschild, 1985)

(b) Retraining of Other Female Agents as Extension Agents

3.11 The training and recruitment of new female extension agents is a long-term process. In the shorter term, one solution is to redeploy female agents who are already teaching to rural women subjects that are closely allied to agriculture.

3.12 In many African countries, home economists constitute a large female professional cadre. Home economists are particularly common in countries influenced by U.S. land-grant extension models and in former British colonies, where they are known as domestic or home scientists. Some are also trained nutritionists and community development workers. Nigeria has 4500 trained home economists. Even Sierra Leone, a smaller country, has over 200.

3.13 Some home economists teach in primary, secondary, or specialized vocational schools, but many work in extension where they traditionally focus on women's domestic and reproductive roles, teaching nutrition, child care, home management, and income-generating skills in handicrafts. These topics are sometimes supplemented in rural areas by home gardening and small livestock care. In some cases, home economists have placed undue emphasis on women's domestic roles and have paid little attention to their critical role in agricultural production.

3.14 In areas that have no female extension workers, home economists could fill this void. Home economists/nutritionists/domestic scientists represent an under-used resource in many countries; planners who tap their potential will find the task of reaching rural women easier. Unlike rural adult educators and health workers, home economists already have training in agriculture. Because of their vast numbers, the regularity of their contact with rural women, and the institutionalized nature of home economics extension in many developing countries, this discipline could be very effective in providing extension advice to rural women.

How to Retrain Home Economists Animatrices to Be Agricultural Extension Agents

(i) First, review the curriculum of the professional institution they attend to assess the level of agricultural training provided. In some schools of agriculture, home economics students are trained in another department of the same intermediate level institution as agricultural extension agents and have common courses with them. The training units in T&V or other extension systems should then analyze skill gaps to identify areas where further agricultural training is needed.

(ii) Second, institute a brief training course (four to eight weeks) in specific agricultural production, processing, or marketing activities identified as being done by women. The home economists should then attend fortnightly training sessions and, where possible, be sent for diploma-level training in agriculture within the first year or so of their service.

(iii) Third, integrate retrained home economists into a unified T&V system reporting to the Chief Extension Officer, rather than a separate extension service. African governments can ill-afford a dual extension service for rural women.

(iv) Once the decision is made to integrate home economists into the extension system, it may be necessary to assign home economists from such ministries as community development or separate departments in agriculture to the extension cadre.

(v) Finally, provide retrained home economists with close supervision and support from their agricultural colleagues.

3.15 Similarly in Francophone Africa, female agents (animatrices) of various ministries or agencies work in villages on a wide range of subjects: health and nutrition, child-care, literacy, small projects, food processing, community development and organization of cooperatives. Although some of their work is on the periphery of agriculture, such as organizing womens' groups to grow crops communally, few animatrices have received agricultural training. With rationalization of their numbers and work, some animatrices could be released for training and absorption into the extension service.

(c) Acceptance by Male Colleagues and Farmers. Once female agents are trained, some male farmers and extension agents have difficulty accepting them as full-fledged professionals. When a group of 217 agents, most of them male, were polled in Northern Nigeria, 89% indicated that they would be willing to help female home-economics extension agents teach agriculture to women farmers. In practice, however, the failure of male extension agents and their Block Extension Supervisors to support a scheme to retrain home economists

Case 19. NIGERIA: USING HOME ECONOMISTS FOR AGRICULTURAL EXTENSION

In Imo and Lagos States, home economists help organize women into groups. They backstop extension agents on farm production recommendations and provide additional information to farmers on food utilization, storage, and marketing.

Case 20: BURKINA FASO: UPGRADING FEMALE OUTREACH WORKERS

There are not enough female motivators (rural outreach staff) to assist the more than 80% of women active in agriculture. Burkina Faso has only 139 female motivators compared to 942 male extension staff. In most cases, female motivators received only a few days or weeks of retraining on agricultural topics; male agricultural extensionists had at least nine months of training. A World Bank mission proposed that women motivators receive the same nine-month training as their male agricultural counterparts to increase their acceptance by male farmers, and that both males and females in the extension service have the same title (Safilios-Rothschild 1986).

critically damaged it. (Abdullahi 1989). In The Gambia, a T&V extension project recognized the need to convince male farmers that female extension agents are the same professionally as their male counterparts (Manneh 1988). Where male farmers are likely to resist accepting female agents, having village leaders and male colleagues or supervisors accompany and introduce them on initial rounds, explaining their role and qualifications, can help.

(d) Attrition of Female Agents and Logistical Support. Their dual career and family responsibilities make it more difficult to post women to rural areas than men. Women are usually responsible for children's schooling and may prefer urban posts for this reason. Women are also expected to follow their husband's jobs. In northern Nigeria, newly trained female agricultural workers left for this reason (Abdullahi 1989). A solution which worked in Imo State, Nigeria, was to select new female agents from the local government area where they will serve.

3.16 Males and females should have equal access to staff housing, equipment, and transportation. Furthermore, female staff upon joining the service should understand that they use the same mode of transport as male staff unless cultural conditions or pregnancy prevent them from doing so.

4. Male Extension Agents

3.17 Despite recent recruitment and retraining of female agents, male agents, who comprised 97% of extension staff in 1981 (Swanson and Rassi 1981), will remain the norm for many years. If the provision of agricultural support services to women farmers is to be improved, then the problems and limitations of using male agents will have to be addressed.

(a) Training Male Extension Agents to Work with Women Farmers

3.18 Male extension agents often hold stereotyped beliefs about women farmers. Their cultural attitudes toward rural women can sabotage policy and program interventions. A recent study by FAO, for example, found that in five African countries male extension agents tended to perceive rural women as farmers' wives and not as farmers in their own right (1987). In The Gambia, male EAs--asked about unfavorable factors in working with rural women--perceived women as poor decision-makers, physically weaker than men, and shy in mixed groups. (Manneh 1988).

3.19 Cultural attitudes of prospective extension agents can be overcome through training and supervision. Pre-service agricultural training institutions need to offer all students practical supervised field work with

women farmers to reinforce classroom training in communication skills and technical information on women's crops and livestock. Colleges of agriculture probably need to develop new training materials for EAs so that they can effectively help female clients.

3.20 Male extension agents and their supervisors already in the service often need to be re-trained to work with women farmers. Middle-level extension personnel generally lack understanding of women farmers' particular needs. Special seminars and workshops where staff interact with women farmers, and regular T&V fortnightly training can be used to overcome attitudes and retool workers. The training should emphasize diagnosis of women's agricultural activities and constraints, the organization of rural women for extension purposes, techniques for working with women farmers, and providing feedback to supervisors and researchers on technology and messages women farmers need.

3.21 After training, staff incentives to encourage male extension agents to work with women farmers should be integrated into the reward structure of the extension system. Recognition can take the form of special citations, training, and the like. The special accomplishments of women farmer: can also be recognized -- through citations and awards of fertilizer, seeds, sprayers, or other farm tools.

CASE 21: MALAWI: MALE AGENTS RESIST INCLUDING WOMEN FARMERS

The Dowa West Rural Development Project in Malawi aimed to increase the incomes and improve the standard of living of 9,300 smallholder families in Dowa West District. Project components included strengthening the agricultural extension services and providing agricultural extension and credit for the target group. Women were identified as beneficiaries in the preparation report, which specified that 60% of the agricultural labor is provided by women and that 30% of the households are headed by females. Five years after the start of the project, female participation was low (19% of the total). A key factor inhibiting women's participation was the resistance of male extension agents to working with women farmers (IFAD 1985).

BOX 6: POTENTIAL CONTRIBUTIONS OF HOME ECONOMISTS:

- Identify and mobilize groups of women to receive regular extension advice.
- Help extension planners collect gender-disaggregated data or compile labor and activity profiles on rural women. Home economists are well-versed in the dynamics of rural households and know who makes decisions and how family labor is mobilized.
- Teach income-generating skills related to processed foods and handicrafts, drawing on their knowledge of home gardening, food processing, and available technology to diversify farm income -- especially during the dry season.
- Serve as agricultural extension agents (with retraining).
- Help introduce new crops or foods using their knowledge of food preferences, uses, and storage. In Nigeria, home economists aided the adoption of a new crop, soybeans, which they taught women how to raise and use. Home economists can also help farm families with dietary advice, especially for vulnerable groups such as children being weaned and pregnant/lactating mothers.

(b) Gender Targeting

3.22 Gender targeting, i.e., the use of women extension agents as the initial contact with women farmers (and male extension agents with males) is a management system which can be effective in bringing extension services to women farmers. It is a logical complement of the group approach to reaching women farmers, and can provide a means of establishing effective communication between women farmers and the extension services despite the limited number of female extension agents.

3.23 The female agents are assigned to work with women's groups and establish trust and credibility with the members. The intention is to assist the groups to gain confidence in dealing with the agent and to encourage them to raise questions about the recommendations. When the process is accomplished, the female agent gradually introduces the group to the agent assigned to the area, who is generally male. The female agent then moves on to work with another women's group.

3.24 In the Cameroon, the MIDENO project found that the gender targeting strategy was most important for groups of medium or low cohesion (Walker 1989). It was also found to be valuable in areas where male agents have particular difficulties in approaching women farmers. Male extension agents with negative attitudes to women farmers will also be more interested in working with women's groups which are beginning to adopt extension messages and present greater possibilities for the successful transfer of new practices.

5. Subject Matter Specialists (SMSs)

3.25 Subject Matter Specialists in the T&V system provide technical training and guidance to extension workers. They link research with the provision of extension advice, and thereby help formulate extension messages. As extension systems target more women farmers, two questions arise: Is it necessary to create special SMSs, such as the Rural Women SMSs as proposed by Benor and Baxter (1984)? And are separate SMSs for women farmers likely to marginalize or enhance services for women farmers?

3.26 Initially, extension services probably need a special rural women's SMS to organize women's contact groups, and to develop extension recommendations that are situation-specific and meet local demands. There should be someone at subdivisional, district, and headquarter levels with specific responsibility for the program for rural women.

3.27 As extension services for women farmers expand, new subject matter areas which may require technical backstopping by SMSs include: dry season activities for extra income, home gardens, food processing, post-harvest storage, marketing, income-generating activities (especially from agro-processing), poultry and livestock enterprises, resource management and conservation, appropriate technology, nutrition, home improvement, and sanitation. Home economists in the T&V system can advise on some of these topics but others may require new specialists. In Imo State, Nigeria, for

example, additional SMSs for rural women are planned for new income-earning enterprises to complement the home economics SMSs now working on food production and utilization.

3.28 If systems can afford only a few SMSs to help rural women, they should concentrate initially on diagnosing women's agricultural activities and constraints and modifying messages as well as developing new messages based on that diagnosis. Their other major tasks should be to organize women to participate in extension and to maintain contact with research. Research institutions are not adequately addressing women farmers needs, so the SMSs will have to take a proactive role in stimulating appropriate research.

**Box 7. TECHNICAL EXPERTISE FOR RURAL INCOME
-EARNING ACTIVITIES**

Income-generating activities are particularly important to rural women and families. They provide self-employment and even out income flows, especially during the dry season, and can usually be done on the farm. In Malawi 41% of women borrowers repaid agricultural loans with income from their home businesses. Home businesses are readily combined with women's responsibilities for child care, food preparation, and household work. Technical information to make these enterprises more efficient and productive is vital to rural households.

6. Contact Farmers and Groups

(a) The Importance of Traditional Women's Groups in Africa for Agricultural Extension

3.29 Sustaining extension services and being able to finance recurrent costs once donor support ends depend critically on identifying cost-effective ways to deliver extension and inputs to farmers. Because of their long tradition in African communities, farmers' groups are a particularly attractive vehicle for reaching women.

3.30 Historically, African women have formed groups to exchange labor, mobilize savings and credit, and for self-help, social and ceremonial purposes. Savings/credit clubs are an important source of informal credit for rural African women who are ineligible for formal credit or who are reluctant to approach formal financial institutions. Women's savings groups in Africa, such as esusu in Nigeria and tontine groups in Francophone Africa, require regular contributions -- and each member receives the collected funds in rotation. Community pressure helps achieve high repayment rates. Labor exchange and mutual support groups are also common, both for the physical advantages of extra help on laborious tasks, and the social pleasure of working together. In the Gambia, for example, labor pooling among women is so common that women spend one-third of individual fieldwork time in other women's fields. (van Braun and Webb 1987, p.14). Joint production and income-earning groups are also common. Self-help groups in Kenya and other parts of Africa often build and maintain community facilities such as clinics, wells, roads, and bridges. Such groups provide an immediately usable channel through which resources and information from government or donors can flow.

3.31 Using groups to receive agricultural information has many advantages. First, it offers economies of scale by maximizing the agent-to-farmer ratio (Box 8). It saves travel time and increases the time spent on

the actual task for the extension agent. Second, it can facilitate adoption of new techniques. Groups provide a setting in which women can learn and practice new technical skills before embarking on their own activities. Group decisions to implement new practices can carry more weight than individual decisions and group settings can encourage otherwise reluctant extension clients to adopt new ideas. Often the cohesion in groups fosters peer learning as well as learning from extension agents. Moreover, groups can be particularly effective in reinforcing knowledge among illiterate women, who can then rely on collective memory.

Box 8. ECONOMIES OF SCALE THROUGH USING GROUPS

The group approach reduces costs by:

- o Increasing the total number of farmers reached.
- o Maximizing agent-to-farmer ratios.
- o Decreasing time and expenses associated with traveling to individual farmers' fields.

In Kenya, it has been estimated that twice as many farmers can be reached at the same cost by using extension groups rather than individual farmers (World Bank 1989).

3.32 Groups also allow members to pool resources for production or collateral to obtain credit and other inputs. They are also an effective means for sharing expensive equipment that individuals could not afford. Groups provide a vehicle for effective large-scale distribution of improved inputs, such as planting materials. They also provide a collective voice to convey to extension officials the needs of women farmers, such as agricultural inputs to accompany the information being provided.

3.33 Groups offer particular advantages to women farmers. Many sociocultural difficulties of male/female interaction are eliminated when male agents work with women's groups rather than individual women. In situations where men do not like their wives to meet alone with male agents, they often have no objection if groups of women meet with the agent. This is particularly advantageous in Muslim societies. Furthermore, in a single-sex group, women tend to speak out more freely than in groups where males are present or when working individually with a male extension agent.

(b) Using Women's Groups to Receive Extension Services

3.34 Women's groups have been used successfully as the point of contact in delivering improved farming methods in many African countries. Among some cultures, (notably Muslim), it is easier for male extension agents to visit groups of women than individual women. As noted earlier, using groups offer economies of scale, and the "group spirit" may promote more efficient learning by providing reinforcement and encouragement. Women's groups, however, must be part of the mainstream extension system and not a means of further marginalizing women.

3.35 In Burkina Faso, women's groups have proven to be effective contacts for extension purposes. Several Nigerian Agricultural Development Projects (ADPs) formed or used existing women's groups to reach rural women in the T&V system. Often home economists serving in the ADPs are responsible for identifying or organizing women's groups, which are then targeted to receive information, inputs or equipment. In Niger State, for example, home economic

extension agents were taught a new technology--growing soybeans--through group farming. Members worked on a common plot on certain days, met their extension agent as a group, and shared the profits of production. Some chose to reinvest in other group ventures or to purchase group-owned processing equipment (Weidemann 1987b). In Zimbabwe, women are enthusiastic about joining women's extension groups as a means of gaining access to extra land and revenues from the sale of additional produce (Skapa 1988).

3.36 Extension delivery may have to be adjusted when groups are used. Since more individuals are reached at any one time in groups, extension visits may have to be longer to allow for sufficient interaction. Topics of common interest are best pursued in groups. Groups should meet in farmers' fields if agricultural information is to be demonstrated and observed. Meeting in village assembly halls is not an adequate substitute for field work.

3.37 When group farming is used by extension agents to teach new technologies to women, time constraints must be considered. In The Gambia, for example, group plots were sometimes so far from the women's own fields that they did not have time to carry out extension recommendations for additional weeding of maize/cowpea fields (Norem and others 1988). Meetings with extension agents should be scheduled at times that do not conflict with women's obligations for their individual or family plots, which understandably take precedence.

3.38 While using existing groups is preferable, new groups can be formed among those with

**Case 22. MALAWI AND BURKINA FASO:
WOMEN-ONLY VERSUS MIXED-SEX
FARMERS GROUPS**

Women unanimously preferred farmers' groups for women only over mixed sex groups in Malawi's Phalombe Rural Development Project. When meeting with EAs, women felt freer to discuss and develop their ideas. In mixed-sex groups, the men delayed repayment and used the money for other businesses -- and so women, who have better repayment rates than men, preferred to obtain credit in women-only clubs. (Evans 1989).

The use of farmers' groups is also common in Burkina Faso's extension system. Women, however, expressed a strong preference for women-only groups where they could express themselves more freely. A World Bank mission recommended that agricultural extension demonstrations be held separately on the collective fields of female and male village groups. (Safilios-Rothschild 1986).

Case 23. KENYA: WOMEN FARMERS' GROUPS

In Kenya, organized groups of 15 to 20 women willingly meet regularly on one farm with an extension agent. Men farmers are apparently less willing to meet in such large groups. Why this is so is unclear, but it probably relates to the tradition of group self-help efforts among women. Evidence from Meru and Muranga suggests that in more than half of the women's groups, at least three-fourths of the members attend sessions with the agents regularly. In about half the cases, extension agents follow up group meetings with visits to the individual women's farms, and report that these women tend to be better adopters of extension messages than individual contact farmers (Safilios-Rothschild 1986). Other evidence from Baringo, Taita Taveta, and Busia confirms that women's groups are highly effective in channeling information, whether for rainfed agriculture, irrigated areas, or drier areas (Muzaale and Leonard 1985). Moreover, available evidence suggests that women's groups include women with varying levels of land, education, and assets: poor women participate extensively and women heads of household tend to participate relatively heavily, although the very poorest may have difficulty keeping up in times of famine (Muzaale and Leonard 1985). Efforts to hold some group meetings on the farms of poorer women could help to reach the poor (World Bank 1989).

common goals. In Nigeria, for example, one ADP organized wives of contact farmers to reinforce information their husbands were receiving and to teach additional skills in women's agricultural pursuits--food processing, preservation, and marketing--suitable to that particular region.

3.39 Extension planners should note that where credit is the principal component of a project or program, women may be inhibited from participating in farmers' groups, particularly if they are formed expressly to channel credit. Since women do not often have access to land title, it is usually men who join such groups. Furthermore, women heading their own households are less likely than men to own enough land to market surplus produce. Credit packages delivered to groups should be carefully conceived so that women are not deterred from joining, thus depriving them of the benefits of both credit and valuable technical advice.

3.40 Selection of group leaders is best left to members, particularly in existing traditional groups. These organizations are likely to have their own norms, criteria, and reasons for selecting leaders, depending on the group's purpose. It may be useful for extension agents to discuss criteria listed in the next section of this chapter before asking groups to identify leaders for extension work.

3.41 Groups offer other benefits to women farmers. They can be mobilized for communal agricultural production as well as for extension. Women's societies in The Gambia are popular because they grow crops on communally assigned land to raise extra money for social and charitable purposes. These groups also hire themselves out to work on other fields to raise additional income for their societies (Norem and others 1988). Groups can also be used for cooperative child care, which frees up women's time for other productive activities. Extension youth groups are an important means of training and motivating a new generation of African farmers. Mixed-sex youth groups help overcome traditions that tend to segregate the sexes and lead to discrimination against women (FAO 1988).

3.42 The importance of groups is an emerging theme in the practice of extension in Africa. Their use, however, does not ensure an effective extension program for women. Groups cannot substitute for missing components of the system, such as relevant research, appropriate messages for those activities in which women are engaged, and credit.

(c) Women as Contact Farmers

3.43 Contact farmers should be selected for certain characteristics. They should:

- o Represent the local range of farm size, cropping patterns, and socioeconomic conditions and be regarded by other farmers as worthy of imitation.
- o Be active, practicing farmers.
- o Be willing to adopt extension recommendations on at least part of

their land, allow other farmers to observe the new practices, and be willing to explain them to other farmers.

- o To the extent possible, come from different families as much as possible.
- o Be from geographically dispersed farms (World Bank, 1984a, b).

3.44 Other contact farmer selection criteria used in Africa that are likely to discourage the participation of women farmers are land ownership, literacy, and the ability to purchase inputs. Asking the advice of village chiefs and elders in selecting contact farmers may also create a bias against female farmers.

Case 24: KENYA: SELECTING CONTACT FARMERS

Women are more likely to be selected if criteria for selection emphasize farming ability and if extension agents make the selection. Findings differed in three areas of Muranga. In Makuyu, where the selection criteria include active involvement in farming and availability to meet agents, more than half the contact farmers are women. In two other areas of Muranga, where land ownership is still a selection criterion, about two-fifths of the agents select women as one-fourth to one-half of contact farmers. Under the two female agents, two-thirds and 90% of the women are contact farmers. In Meru, where chiefs often select contact farmers in local meetings, fewer women are contact farmers (World Bank 1989).

3.45 Subtler built-in biases against the selection of women contact farmers, include the previously mentioned likelihood that male extension agents feel more comfortable, at least initially, with male farmers and consider women as farmers' wives rather than as serious farmers in their own right. These attitudes have an overwhelming collective effect considering that currently 93% of extension personnel in Africa are male (FAO 1988).

3.46 Three ways to increase the number of female contact farmers in Kenya have proven effective: to encourage chiefs, ministers, and political leaders to take a public stand at local gatherings and in the media in favor of female contact farmers; to emphasize the selection of women farmers during training programs for extension agents; and to encourage extension agents to select contact farmers on the basis of merit rather than for patronage (World Bank 1989). Actual experience in working with women contact farmers often persuades male extension agents that this approach is effective. Evidence from Nigeria and Kenya, for example, indicates that some male agents prefer working with women farmers because women are more likely to follow their advice and are doing most of the farming anyway (Nnonyelu, 1987, World Bank 1989).

3.47 Quotas are sometimes recommended to increase the number of female contact farmers. While quotas would highlight the need to include more women and raise the consciousness of agents about the issue, general targets and benchmarks are preferable provided they are preceded by thoughtful analysis of prevailing agricultural practices and followed by frank and open discussion

among agents. If quotas are adopted, they should involve positive incentives rather than punitive measures for program managers.

3.48 Proactive, voluntary approaches are preferable to quotas. All agents should be properly trained in analyzing farm households to recognize the resources, constraints, incentives, and obligations of household members, including women. They should also be taught to organize and communicate with women farmers. They should then monitor a certain number of women farmers, the methods used to reach women, and women's adoption rates and responsiveness to extension messages.

7. Women Farmers' Access to Training

3.49 Women's access to extension offered at residential farm training centers will be limited unless transportation to the centers is arranged and separate residences for women are made available at the centers. Time constraints and child care obligations further limit women's participation in courses away from home.

3.50 Mobile training courses for farmers can be particularly helpful for women farmers. They are much more accessible to women who cannot (or are not allowed to) stay away from their homes for the required training time. In Zambia, for example, the Agricultural Sector Support Programme used mobile farmers' training courses which a recent evaluation found most effective for women farmers. In the Eastern Province, for example, approximately one-third of the participants in mobile courses were women. The Government, recognizing the effectiveness of these mobile courses, has decided to shift from Farmer's Training Centers to mobile training.

Case 25: ZAMBIA: WOMEN FARMERS ACCESS TO TRAINING

A study in Northern, Central, and Southern Provinces reports that only 5% of the women in those provinces had attended farmer training courses (Gaobepe and Mwenda 1980 cited in Safilios-Rothschild 1985, p.20). In Eastern Province, only 15% of those attending were women. The aim was to raise women's participation to 25%; the main constraint was transportation. (IRDP Annual Report 1982 cited in Safilios-Rothschild 1985). In the Samfya District, where 41% of the farm households are headed by women, no women attended the courses offered at the residential Samfya Farmers Training Centre throughout 1983. One of the main reasons was that women farmers who were heads of households were unable to take several weeks off to attend classes away from their village.

3.51 Reaching rural audiences through mass media: Radio and television are promising as adjuncts to -- not as substitutes for -- face-to-face extension. Attention should be paid to timing messages to coincide with agricultural operations and to scheduling transmissions at times suitable for women.

3.52 Radio has a long history as a communication tool, especially in agriculture. Its low cost and wide reach make it a relatively simple, effective technology for development. Television is less widely used because

of production and equipment costs. While Sub-Saharan Africa has about 8% of the world's population, it has only 2% of the world's radio receivers and 0.7% of the world's television receivers. An estimated 70% of rural Africa now has radio coverage, but access varies widely between rural and urban areas, males and females and among countries. Audio and video cassettes have extended the reach of both radio and television broadcasting.

3.53 Both radio and audio cassettes can effectively convey agricultural information to many rural (often illiterate) women in Africa. Both are inexpensive, widely available, and useful with illiterate audiences. They are especially effective for reaching women in Islamic seclusion, or purdah. Radio also has the advantage of being able to return to the same subject over time; this is important where decisions are made on a group basis by consensus. It is important, however, that programs be broadcast when women have access to radios and the time to listen. Broadcasters should also remember that, because of their lower education levels, women may be less fluent in national languages and more comfortable with local dialects. Radio forums or listening groups are more effective and stable over the long-term when structured around traditional groups which have functions other than radio listening. Radio messages should also slightly precede the messages from extension agents. Evidence from Ghana, for example, has shown that female farmers question extension agents about subjects already discussed on the radio. (Spurling 1989).

Case 26. NIGERIA: RURAL RADIO OWNERSHIP

In Northern Nigeria, Olayiwole (1984) reported 100% radio ownership in one of two Muslim villages studied and 97% in the other. Fifty-four percent of Muslim women in the second village listened to farm broadcasts and 85% tuned in to women's programs.

3.54 Videocassettes. Videocassettes can be very useful in training agents and farmers in agricultural extension. They have been successfully used for training in Latin America and are now being used on a limited basis in such African countries as Nigeria. Video courses could be prepared for low-resource farmers, including women, for distribution to local extension units together with supporting visual and printed materials. Such a package could be taken to villages for viewing by farmers--followed by discussion and supervised practice sessions. Viewing by women's groups would be even more cost-effective.

Case 27. TELEVISION AND VIDEOS IN FRANCOPHONE COUNTRIES.

Niger, an early user of educational television, is participating in a unique experiment with a rural television network for non-formal adult education. Programs broadcast in local languages are viewed in community centers around the country. In Cote d'Ivoire, solar-powered TVs in village centers played videos of football matches which attracted audiences who afterward stayed on to watch agricultural extension videos (Spurling 1989).

Conclusion

Extension messages cannot be effective unless they reach the client - and at present the messages are tending not to reach women farmers. This need not be the situation. As the examples and case studies given in this chapter demonstrate, there are many ways of reaching women farmers that are successful and do not transgress cultural mores. The answer is to find a method suitable for both the local traditional culture and the local financial and human resources and institutional organization. Within a heterogenous country it may be necessary to have several approaches. The main driving force has to be the desire of management for an extension service supporting all farmers. Management must be willing to face up to the problem, be innovative in finding solutions and influential in persuading the staff to change approaches and attitudes.

Summary

The gender of the extension agent does matter. In certain areas, a male agent cannot work with a female farmer and, even where there are few barriers, communication is improved when female agents are used. Numbers of female agents can be increased in the long-term by recruitment and in the short-term by retraining of home economists or animatrices. To be successful, female agents must be accepted by male colleagues and the farming community, and solutions have to be found to career/family conflicts and to cultural restrictions to their work. The majority of extension agents will continue to be male, so that increased technical knowledge of women's farming and training in methodologies of working with women farmers are needed. Subject matter specialists with responsibility for women's farming have a pivotal role in increasing understanding of the subject, in training and monitoring of extension agents and through feedback to research and development in the generation and development of messages appropriate to women farmers.

Extension service contacts with women farmers must be increased. In many countries, the women's groups traditional in African communities have proved a successful vehicle for reaching women. Groups can be multi-functional or have specific functions - inter alia labor exchange, savings and credit, self-help, social and ceremonial, and communal agricultural production. Groups offer the advantages of maximizing agent-to-farmer ratio, facilitating adoption of techniques, overcoming socio-cultural and illiteracy constraints, and pooling of resources. Women tend to have higher credit repayment rates than men and women's credit groups can have an important role in bypassing the rules which restrict women participating. The selection of women as contact farmers could be increased if criteria which exclude many women farmers (such as land ownership, literacy) were removed. Subtler in-built biases by village elders and male extension agents also discourage the selection of females as contact farmers.

Training of women farmers should be reorganized to take account of their training needs, availability and educational levels. Women's participation in courses at residential farm training centers is limited by time and cultural constraints and child care obligations, and by transport and the availability of facilities at the centers. Possible solutions are mobile training courses and the use of audio mass media in the vernacular.

CHAPTER 4: IMPROVING THE LINK BETWEEN EXTENSION AND RESEARCH

4.01 An extension system is only as effective as the technology offered. In summing up the relevance of the research on the crops and livestock for women farmers, Baxter (1986) stated that technological developments (especially in varietal and implement improvements) have tended to benefit "men's" tasks and crops more than "women's." As a result, new technologies have not met the needs of many women farmers in Africa.

4.02 To help women more, agricultural research should broaden its thematic scope to include processing, utilization, and storage, and its disciplinary scope to include the social sciences. Agricultural research must also adopt a more collaborative approach to identify the research agenda.

4.03 In her review of research in the Consultative Group of International Agricultural Research (CGIAR) institutions, Jiggins (1986) concluded that unless the decision-making process in research involved more producers, consumers, workers, traders, and processors, researchers' work would have negative consequences for women. She contended that researchers in the early stages of research ignore the fact that most food in developing countries is processed, preserved, and prepared in rural households by women. Jiggins stated that the record of the International Agricultural Research Centers (IARCs) on gender issues has been conservative, with hesitant and cautious exploration stimulated largely by donor-financed initiatives. Moreover, the way the research process is organized and research criteria are derived stands in the path of more substantive efforts (Jiggins 1986). She concluded that the comparative lack of organized research support--especially for crops, stock, and varieties grown by women--and the neglect of women's roles in germplasm conservation and seed selection, all hinder the development of technologies for women's farming activities.

4.04 It is within the national agricultural research systems that the bulk of the research targeting women farmers should be carried out. Present research systems, however, tend to concentrate on products that are exportable or are major items in government statistics. Often these products are grown more by men than by women. Less attention is paid to minor food crops and other products with which women are associated. Moreover, the technologies developed for men farmers may be less appropriate for women farmers, whose objectives and constraints differ.

4.05 To develop the technology to make rural women more productive, research systems must focus more effectively on the needs of female farmers. Identifying a suitable research agenda requires collaboration, and an understanding of women farmers' circumstances based on adequate socioeconomic and baseline agricultural data. African governments and the World Bank and other donors are forging stronger link between the generators of technology in research institutions and the disseminators of extension messages. Initiatives are also focusing on the now tenuous links between the research/extension (R/E) system and low-resource farmers. Links between R/E and women farmers are even more fragile, and only now beginning to be highlighted.

1. Developing a Research Agenda Targeting Women Farmers

a. Identifying the technology needs of women farmers

4.06 The first step in developing a research agenda for women farmers requires identifying their needs based on the following information:

- A description of the farming system (including crop associations and crop/livestock integration) and its component enterprises (main and minor crops, livestock, gathered crops, and processing enterprises).
- An analysis of the objectives, activities and constraints of women farmers in the home, farm, and community.

4.07 Planning relevant extension programs requires knowledge of the specific activities and contributions of rural women to income and productivity. The socioeconomic and household level analysis that can provide such information is too often omitted from the research design. Socioeconomic research can also help determine whether technologies will be adopted by women or will result in lost income, lost control of income, or additional demands on women's labor.

4.08 Examining the current farming system to learn how problems are presently being solved may point the way to solutions which can be tested immediately. Researchers should review women's current agricultural practices as well as how to combine them with modern technologies, knowing that women are more likely than men to be partial adopters of recommendations because of cost and time constraints. Technologies offered to women and to small farmers in general should also emphasize the use of internal resources (such as labor and plant and animal wastes) as opposed to external, purchased resources. Finally, involving the end-users in the initial stages of technology development will increase the likelihood of their accepting the technology.

Case 28: The GAMBIA: LOW-COST, LOW-INPUT TECHNOLOGY INCREASED WOMEN'S INCOME

Staggered planting of women's horticultural crops in a pilot project in the Western Division led to significantly higher economic returns: 7.4% for tomatoes, 2.8% for onions, and 1.4% for cabbage. The researcher considered the crop demands for labor before recommending staggered planting. (Daniels 1989)

4.09 Information on women's agricultural enterprises should be gathered from three main sources:

- Baseline socioeconomic and agricultural data, disaggregated by gender to reflect the true magnitude of women's agricultural enterprises.
- Farming Systems Research (FSR) or similar diagnoses. FSR, which has been integrated into some extension projects, can improve

feedback from farmers to research/extension, and between extension and research services. FSR, a multi-disciplinary approach, that blends social and agricultural production sciences, looks at the entire farm and farm family, including women's involvement in the home and on and off the farm. "In collaboration with farm families, appropriate technology is determined (usually from available technology) and evaluated on their fields and under their constraints. FSR implies a two-way flow of knowledge between farm families and researchers." (Flora 1982)

- Feedback from extension. Two-way communication between farmers and researchers is essential if appropriate messages are to be generated. But communication will be effective only if the channels of communication are used and the messages -- heard and acted upon. The farmer-to-extension-to-research feedback loop-- that key component of the T&V system that ensures the appropriateness of extension messages is the most difficult to achieve as it moves against the traditional hierarchical flow. The difficulty is exacerbated when the primary purpose of a meeting is for the flow of information down the hierarchy (research to extension, or extension to farmer). Gender adds yet another social barrier to equal exchanges. Research and extension staff must be sensitized to this problem and trained in methods to overcome it.

b. Reviewing the Existing Research Program

4.10 The second step is to review the present research program, to see how well it addresses the problems identified and covers the agricultural activities of women. If it falls short, the following questions need to be asked:

- Can the program objectives/goals be adjusted?
- Can the evaluation criteria be adjusted?
Yield, often a key criterion, may not be the only criterion, for example. For female farmers, other criteria may need to be considered: reliability; sustainability, taste, and whether the crop is easily processed or stored, or is multi-functional, or whether its byproducts are usable.

c. Restructuring the Research Agenda to Meet the Needs of Women Farmers

4.11 The third step is to propose a new research program to fill in the gaps. Women farmers generally need a broader range of research recommendations than their male counterparts. Researchers must look beyond production into harvesting, processing, storage, and nutrition. The International Potato Centre (IPC) suggests that by broadening the relevant themes in agricultural research to include not only field production, but also storage, processing, gardening, and marketing makes the research and technology more relevant to women. The International Institute for Tropical Agriculture (IITA) and the International Food Policy Research Institute

(IFPRI) also emphasize the importance of looking at the household complex and its many tasks, from production to consumption. (Rockefeller Foundation/ISNAR 1985).

Box 9: RESEARCH AGENDA FOR WOMEN FARMERS

<u>CONSTRAINTS</u>	<u>RESEARCH SOLUTIONS</u>
1. <u>LAND</u>	
Limited Land	<ul style="list-style-type: none">. Multiple and relay cropping.. Intensification using fertilizer.. Higher value enterprises requiring little land, such as poultry, or rabbits.. Value added through processing.. Terracing and mulching.
Problems with Fertility	<ul style="list-style-type: none">. Alley cropping.. Mixed farming, mixed crop/livestock systems using small ruminants.. Fertilizers.. Soil conservation techniques.. Use of household refuse, compost-making.
2. <u>CREDIT</u>	<ul style="list-style-type: none">. Low-input technologies requiring management rather than purchased inputs.. Inputs in smaller packages.. Credit groups--traditional/new.
3. <u>LABOR</u>	
Availability/Seasonal Variations	<ul style="list-style-type: none">. Labor-reducing technologies such as herbicides and multiple cropping.. Appropriate mix of farm enterprises.
Physical Strengths/Weaknesses	<ul style="list-style-type: none">. Appropriate technologies for such strenuous tasks as water collection and food processing.. Tool and machine design.. Application rates in measures which can be transported and used easily.
4. <u>TECHNOLOGIES</u>	<ul style="list-style-type: none">. Animal traction.. Tools such as hoes, small tillers, carts.. Small affordable irrigation devices.. Machines for harvesting/processing.
5. <u>EDUCATIONAL LEVEL</u>	<ul style="list-style-type: none">. Recommendations in visual and oral form.
6. <u>SOCIOCULTURAL</u>	<ul style="list-style-type: none">. Enterprises acceptable for women.. Appropriate extension delivery systems.

(Spurling, 1989)

2. Generating Technologies for Women Farmers

4.12 To fully address socioeconomic constraints it is important that technologies targeted at women farmers be developed through participative research at the farm level within the context of the farm and social unit. This is especially so for the household garden because of its small size, mix of crops, intensity of production and integration with other aspects of the household.

4.13 Participative research involves the research system, the extension system, and the farming community. Often the smallest independent social unit is not the family but the extended family or village. Community obligations and rules -- concerning the access of livestock to fields after harvest for instance -- restrict the freedom of the farmer or family to make independent decisions about their farming practices. Participative research takes into account both the farming and social systems. It is multi-disciplinary and, multi-institutional, involving agricultural ministries and community development and local government organizations.

Box 10: REDUCING RISK FOR WOMEN FARMERS ADOPTING TECHNOLOGIES

Individual women farmers may not want to test new technologies on communal plots because of the perceived risk. An alternative is the Small Plot Adoption Technique (SPAT) whereby farmers test recommendations on small 10m x 10m plots. This worked well in the T&V extension project in Imo State, Nigeria, where new crop varieties or new production recommendations were tried out on small plots. The extension agents were encouraged to establish such plots in areas where most farmers within the area were farming. This enables the agent to communicate messages to many farmers with minimal additional cost. Over 40,000 such plots have been established in Imo State, focusing on cassava, rice, maize and cowpea. About 75% of farmers participating in the small plot technique were women. (Okoro 1989)

4.14 It is important to recognize that new technologies can shift economic control, employment opportunity, and profit from women to men. A classic case is the introduction of the palm oil press in Nigeria. Palm oil pressing had been exclusively a women's activity, but with the introduction of new machine technology, men took over the activity. This was partly because the new technology was attractive, and partly because the machine -- being designed for men -- was too large for women to handle. Women lost access to by-products of the pressing, which they had formerly used for fuel; the daily time schedule for using the press was inconvenient for women; and, since all the oil extracted belonged to the men, women did not benefit from the increased oil production. (Obibauku, 1966)

a. Research on Food crops

4.15 Research institutions are making some progress on crops commonly grown by women, particularly food crops. Cassava is often categorized as a "woman's crop" in many of the warmer, moister regions of Africa. Research

institutions are making advances on breeding cassava for local adaptation in Cameroon, Gabon, Ghana, Liberia, Mozambique, Nigeria, Rwanda, Sierra Leone, Sudan, Uganda, and Zaire. The varieties developed so far, however, do not "store" well in the soil (Yates 1989). This is a problem since cassava is often grown as insurance against food shortage. There is reason to expect further improvements resulting from cassava breeding programs over the next decade.

There is also scope for moving existing local cultivators with desirable features from one area to another which they have not reached. As Carr (1989) has noted, this is happening continually African rural communities but is an aspect of technology transfer which deserves more detailed attention on a pan-territorial basis by extension services. The fact that this has not always occurred is in part a reflection of the low esteem with which many agricultural staff view cassava, despite its dominant role in the cropping pattern of the humid tropics of West and Central Africa.

4.16 Cowpeas and soybeans, often grown by women, are of special nutritional interest because of their protein levels. Cowpea--frequently is intercropped with maize, sorghum and millet--yields very poorly (about 0.25t/ha). The International Institute for Tropical Agriculture (IITA) is working with national agricultural research institutes to develop disease-resistant, locally adapted strains. Soybean is a minor crop but as a result of the recent release of adapted varieties production is grown increasingly in Nigeria, Zambia, and Malawi. Besides improving household nutrition, the sale of home-processed soybean products offers good income-earning potential for rural women.

4.17 Disease-resistant leguminous grains--such as chickpea, pigeon pea and groundnut for dry zones--still face major stress-resistance problems and it will be some time before major advances are achieved (Yates 1989). Banana and plantain--important crops in moister or irrigated regions of Africa--do not appear to get significant research support. Various horticultural crops, often grown by women, such as citrus, pawpaw, and pineapple, are now receiving greater attention from national departments of agriculture which are multiplying and distributing plants.

b. Alley Farming

4.18 Alley farming is a particularly innovative farming system with the potential to benefit women farmers considerably. It involves the practice of growing crops in between rows, or of fast growing leguminous trees or shrubs. The tree roots fix nitrogen in the soil. More importantly, when the trees are pruned and the leaves are mulched on the soil, they act more as "fertilizer bushes" supplying a continuous source of nitrogen and potassium throughout the

Case 29: NIGER: RESEARCH TO DIVERSIFY FOOD CROPS GROWN BY WOMEN

In Niger, research efforts are underway to improve the culture of "minor" food crops, thereby diversifying the food crops grown by women. These crops are presently onions, tomatoes, salad vegetables and potatoes. This year, research is underway on three important "minor crops": bambara nuts (voandzou) which are high in protein, tolerant of dry conditions, and a monocrop good in rotations; sesame for home use in sauces and sale of surplus; and okra which is grown in the heavier soils of the more humid, low-lying areas and used fresh or conserved by sun-drying. Spurling (1989)

cropping season. The left-over branches after pruning provide fuelwood; prunings used as mulch eliminate soil erosion; and during the dry season, the "fertilizer bush" can be cut and used as a nutritious source of animal fodder, as well as generating plenty of green manure for the next growing season. The primary benefit of alley farming is that the fertilizer which is naturally released, regenerates the soil and offers women the possibility of greatly extending their cropping period. This possibility is the only feasible alternative to shifting cultivation, common among small-scale farmers today.

4.19 Farmers everywhere, especially women, are reluctant to plant trees. Identifying the "concerns" of the potential adopters and establishing "congruence" between the interests of the farmers and the new method of farming is critical to increase the numbers of adopters. This was achieved at a research site of IITA by recognizing that farmers did not believe "trees" should be on farm fields. The extension approach of calling alley cropping the "fertilizer bush" brought a rapid increase in numbers of farmers planting alley farms. However, research institutes also need to recognize that acquiring expertise in using the system is a process, not an event. Alley farming as an alternative to shifting cultivation, or what is basically a lifestyle to African farmers, requires changes in farming behavior and cultural attitudes. Research needs to focus on the support that farmers require to sustain their alley farms and the consequences which arise from making different uses of the products of the system, e.g. mulch versus fodder (Cashman 1989).

c. Livestock

4.20 Raising small ruminant animals and poultry are often women's activities. Although sufficient work appears to be in progress on animal husbandry, animal housing and breeding stocks, animal nutrition is a major problem because of seasonal fluctuation in feed supplies and farmers' inability to purchase external inputs (Yates 1989). Alley farming and small intensive feed gardens for fodder production are promising technologies for improving animal nutrition. Many women in rural areas combine goat production with food processing activities. Cassava peels or other by-products of small-scale food production, combined with household wastes, are an important livestock feed. Owning a small number of animals can be an attractive, efficient subsidiary enterprise, complementing crop production. (Okali and Sumberg 1986)

d. Labor-Saving Food Processing and Storage Technology

4.21 Without technologies to reduce the time-consuming tasks of fuel and water gathering, women will have little time or energy to attend extension sessions, adopt recommendations, and thereby improve agricultural practices.

4.22 Organized research should do for household production activities what agricultural research does for farm production activities. Long overdue advances are such technologies as "simple equipment to break and remove the hard husk of sorghum that would eliminate the backbreaking work of so many women throughout Central Africa.... much of the work in agriculture in many countries of Africa is done by women [so] a part of agricultural research

should be oriented to this activity of women" (T.W. Schulz 1982, pp.8-9).

4.23 Women's farmers' greatest needs in appropriate household technology fall into three categories: (1) fuelwood and water collection, (2) food processing, and (3) food preservation and storage. Increasing attention is being paid to developing technology for food processing--for example in Senegal, Nigeria, and Cote d'Ivoire. The problem has been adapting these technologies for rural women. In Nigeria, for example, many of the technologies developed in the Rural Agro-Industrial Development Scheme have not been adaptable for use at the household or village level. But in some T&V projects in Nigeria, staff in technology units are working side-by-side with extension personnel. This could be an important step toward having technology tested by end-users, adapted, and sold at reasonable prices.

4.24 For women to benefit fully from food processing technology, machines should:

- Be inexpensive enough to be owned by women.
- Be designed for the weight, height, strength and limb length of women.
- Be small and inexpensive enough to be kept by individual women in their compounds or portable and communally owned so that women can combine work with child care and other domestic responsibilities.
- Have a basic mechanism and interchangeable parts so that they can be used to process different seasonal crops. (Ladipo 1976)

4.25 Too little attention has been paid to post-harvest storage, which is critical for feeding the family through the hungry season and increasing prices women receive for their produce. For example, in the Gambia, lack of simple, inexpensive onion storage means women must sell their produce during market gluts when prices are low. Traditional storage methods such as drying, smoking and preserving of vegetables, fruits, and meat need improvement to reduce the losses common now. Grain storage, an activity for which women are often partially responsible, is an enormous problem. Large percentages of crops are lost annually on the African continent because of inadequate storage facilities.

e. Justifying Research on Women Farmers' Needs

4.26 Programs targeting women farmers may have funding difficulties given:

- Underestimates of the actual or potential value of goods and services produced by women because these tend to be consumed at home or marketed in the informal sector.
- The fact that many crops, while important in terms of family nutrition and women's income, do not appear in statistics.

4.27 To justify programs targeting women, it is important to:

- Reassess and educate the public on the value of women's

production.

- Assess the economic and social benefits which result from women's production, e.g. improved nutrition, increased funds for school fees, better healthcare, etc.
- Assess and educate the public in the increase in production if women were fully included in agricultural support services.

f. Institutional Arrangements

4.28 How can national and international research organizations best collaborate to develop a research agenda to meet the needs of women farmers? The International Agricultural Research Centres (IARCs), in their relationship with the national research organizations should:

- Sensitize policymakers and researchers to the importance of considering users in setting priorities and programming for research.
- Inform policymakers about research results and technologies or potential technologies and their policy implications.
- Develop methodologies for survey work and for testing and validation of research that give full consideration to user needs.
- Train researchers in the use of these methodologies and in programming user-oriented research. (Murphy in Rockefeller ISNAR 1985)

4.29 While the IARCs clearly have a role in sensitizing national researchers and policy-makers to the importance of addressing women farmers' needs in research and technology, it is the national research institutions which should undertake the bulk of this research and inform policymakers about implementation and adoption. As ILCA has emphasized: "When policy constraints are a limiting factor in adoption, national agencies are in an advantageous position to encourage policy changes" (Jiggins 1986).

4.30 To develop the technology to raise the productivity of rural women, these national research systems must focus on the tasks, enterprises, constraints, and objectives of female farmers. A collaborative approach and an understanding of women farmers based on adequate socioeconomic and baseline agricultural data are crucial. As such data become available, special efforts will be needed to share it, since individuals and institutions that are not part of the CGIAR system are likely to be the dominant actors. One recommendation is to develop a "clearinghouse-cum-network." (L.S. Hardin, in Rockefeller/ISNAR 1985, p.18).

Conclusion

4.31 The extension service will only be able to "sell" the extension message if that message suits the farmer's situation. This 'suitability' has various aspects. Most farmers will consider changing an established practice or trying something new only if the proposed change technology answers a need the farmer has expressed, is appropriate and relevant to the individual

situation, if accurate and reliable, and is relatively low-risk. Research should be based on farmer's problems, and farmers should be involved in suggesting solutions, formulating treatments, testing those treatments, and evaluating the results.

Summary

An extension system is only as effective as the technology offered. Technological improvements to date have tended to:

- concentrate on "men's" activities;
- use evaluation criteria which ignore women's farming objectives;
- generate technologies which are inappropriate to the resources and potential adoption patterns of women farmers.

When generating appropriate technologies, the end-user should always be considered. This means:

- identify the technical needs of women farmers;
- review current practices and technologies for possible solutions;
- review current research program for research gaps;
- develop a research agenda which responds to needs of women farmers;
- conduct participative research within the context of the farming and social systems;
- develop messages appropriate to the end-user circumstances.

The scope of research should include:

- crops (staple foods, legumes, fruit and vegetables) and livestock (poultry and small ruminants) produced by women;
- technologies and farming systems suitable to the circumstances of women farmers (such as, alley cropping);
- post-harvest operations (processing, preservation, storage, and marketing);
- appropriate and labor-saving tools and machinery (particularly for water and fuel collection and utilization);

For women to benefit from tools and machinery, these should be:

- inexpensive;
- designed for the physical characteristics of women;
- have a use pattern compatible with child care and other obligations;
- multi-purpose.

To the extent possible, to justify research programs targeting women farmers, it is necessary to assess the financial and social benefits of the home consumed or informally marketed goods and services produced by women.

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