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Constantina Safilios-Rothschild
The Pennsylvania State University

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The Role of Women in Modernizing Agricultural Systems

Constantina Safilios-Rothschild
The Pennsylvania State University

A significant recent breakthrough in agricultural economics has been the recognition that increased agricultural productivity and food availability as well as rising investments in agriculture do not benefit rural people equally due to existing class differentiation. In fact, it has been recognized that the introduction of modernizing agricultural systems that increase efficiency and productivity tend to increase the gap between the large and medium land holders and the small land holders who are often obliged to sell their land and swell the ranks of the landless. Thus, it is now accepted that the criteria of efficiency in agriculture must be supplemented by criteria that reflect distribution of income and labor absorption concerns in order to not penalize the rural poor in the process of modernizing agriculture (Hardin, 1979; Fuller, 1979). There is, however, another significant step of recognition that agricultural economists must go through, namely the recognition that at present rural development programs do not benefit men and women equally due to existing sex stratification and sex inequalities. In fact, as is true for the rural poor, women do not benefit equally with men from rural development schemes because they have less access to land ownership, credit, and agricultural information within the context of a usually all-male agricultural extension service. Also many rural development programs which benefit men by increasing their agricultural income increase sex inequalities by eliminating the employment opportunities

of poor women as hired agricultural laborers. It is, therefore, necessary that the distributional and labor absorption criteria to be added to the efficiency and productivity criteria in the design of modernizing agricultural and other rural development programs in order to be able to take into account that poor rural women are affected by two types of inequalities: class and sex inequalities and both must be addressed in order for development to reach them as much as men.

There are many reasons which may be responsible for the fact that the second step of recognition has not been reached. Some of these reasons may be the "invisibility" of women that is, the insufficient documentation of the role of women in agriculture and the prevailing sex role stereotypes about women's questionable willingness to take risks and adopt agricultural innovations and ability to deal with the complexity of modernized agriculture requiring better accounting, and more sophisticated technology. The lack of sufficient data and the lack of integration of the available data from the Women and Development literature into the mainstream agricultural economics literature further accentuate the "invisibility" of rural women and the persistence of stereotypes about them.

Many reasons contribute to the fact that there is not much information available at present in the "mainstream" statistics and literature about the direct role played by women in LDC's in modernizing agricultural systems. First, a number of agricultural economic research studies yield no information about the role of women because the collected data on agricultural labor (referring to family labor) and household income are not disaggregated by age and sex. Second, Census statistics as well as statistics collected by international agencies and organizations consistently underestimate women as agricultural laborers, when they contribute their labor as unpaid family

labor (Safilios-Rothschild, 1981; Youssef, 1980; Youssef and Buvinic, 1980; Recchini and Winerman, 1979). But even surveys and studies carried out at the community level by agricultural economists often underestimate the magnitude and prevalence of women's direct involvement in agricultural work because the husbands are only asked and/or because the question about agricultural involvement are asked in a way that it may be culturally unacceptable for women to respond affirmatively. These difficulties can be illustrated with an example of a series of intensive community studies recently undertaken in rural Honduras.* When the husbands were asked whether their wives worked in the fields they responded negatively and when the wives themselves were asked the same question, they also denied such involvement. Women were, however observed to be actually working in the fields so alternative questions were tried out in order to understand the underlying dynamics.

Finally, it was determined that when wives were asked what agricultural tasks (tareas agricolas) they were responsible for, they gave a long list of such tasks that substantiated women's very active and extensive involvement in agricultural work. Since, however, it is culturally expected that the men will be responsible for agricultural work, both men and women are reluctant to report women's extensive involvement in agriculture which tends to be assumed under wife's duties.

This is an important factor in the underestimation of women's active involvement in agriculture in Central and Latin America as well as in many Muslim societies. Other reasons include women's casual or temporary employment for example during harvest rather than on a permanent basis and the hiring of entire families to work on plantations where women and children work as well

*The Project is an AID funded study of the socio-economic impact of the agrarian reform on the different members of the family administered by the Population Council and carried out by a Honduras research team under the supervision of the author.

as men but only the men are paid and are counted as working (Conditions of Work of Women and Young Workers on Plantations, 1970). All these sources of underestimation have been more frequently reported for Latin and Central American Countries for which the smallest percentage of women's involvement in agriculture is officially documented (Wolf, 1977).

The lack of a consistent pattern of disaggregation by age and sex of agricultural labor and household income data has serious repercussions because it tends to mask some of the expected or unexpected impacts of development programs on women, younger and older as well as the extent of wives' economic contributions to the household. In Indonesia, for example, some agricultural economic studies of the impact of the new harvesting methods and of the introduced new rice husking technology (steel roller hullers) show that the demand for hired labor has sharply declined bringing about serious income losses, especially to landless families but do not specify whose hired labor is displaced (Utami and Ihaloaw, 1972). Other similar studies in Indonesia, however, which differentiated hired labor by age and sex showed that the large majority of displaced hired labor were women, older women being more hard hit in terms of income losses (Collier and Soentoro, 1978; Collier, et al, 1974; Stoler, 1977).

The assumption that family labor availability could be determined by knowing the number of active family members regardless of sex and age and regardless of the type of crop contemplated has been proven faulty in designing rural development programs. An evaluation of the World Bank experience with rural development projects in West Africa clearly showed that female labor is available on a different basis than male labor and that transferring female labor from subsistence to cash crops was often problematic and brought about a number of negative consequences for the status of women and the nutritional status of children (Rural Development Projects: A Retrospective View of Bank

Experience in Sub-Saharan Africa, 1978; Safilios-Rothschild, 1980). Furthermore, since in many rural areas in which women already are working 12-15 hours a day in household, childcare, and productive activities, their labor cannot be made available for the intensive cultivation of HYV's unless provisions are made to free them from some time-consuming household duties (Safilios-Rothschild, 1980; Carr, 1979; Whiting and Krystall, 1979).

The use of household income in agricultural economists' studies, on the other hand, masks the fact that women make significant economic contributions ranging from 1/3 to as much as 1/2 of the total family income, their contributions being more significant in low-income rural households (Evenson, Popkin, and King-Quizon, 1979; Cain, 1979; Srikantan, Narayan, and Rao, 1978). Preliminary data collected in rural Honduras also indicate that women's contributions to the money needed to buy food for the family are even larger than the overall contributions to family income. The lack of disaggregated income data by sex is serious because it does not allow policy makers' sensitization to the importance of women's income-generating opportunities for the survival of rural low-income families. Furthermore, not knowing how men's and women's incomes are used does not provide planners the necessary information for balanced development planning that allows both men and women to earn an income. Studies from India (Kumar, 1977), Philippines (Popkin and Solon, 1976), and Northern Ghana (Tripp, 1978) point out the relatively more significant role paid by women's than by men's earned income for the nutritional status of their children. More specifically, in landless families in Kerala, India the aggregate household income was a weak and statistically insignificant predictor of child nutrition. Increases in maternal income, on the other hand, were significantly associated with children's nutritional status but when women did not work for wages, increments in the husbands' income were not

associated with improved nutritional status for the children (Kumar, 1977).

Despite the underestimation of women in agriculture in many LDC's and despite the scarcity of relevant data resulting from aggregate family labor and household income data, there is sufficient evidence from many LDC's that women play an important or the most important role in agriculture. On the basis of available information, we shall examine the extent to which women are actively involved in agriculture whether they are involved as farmers, as unpaid family labor, or as hired agricultural laborers; their involvement in cash crops, their innovativeness, their productivity and farming practices as compared to those of male farmers. By now it is pretty well accepted that in Sub-Saharan Africa, women constitute half or more of those involved in agriculture, the majority of whom are small farmers involved in subsistence agriculture, mainly because their husband has migrated, died, or divorced them. But even when their husband is present, they are still involved in subsistence agriculture and often provide most of the agricultural labor for the husbands' cash crops. Even among Sub-Saharan African countries and regions within countries there is, however, considerable variation with regard to the prevalence of women as farm managers or as agricultural laborers and their degree of involvement in subsistence and/or cash crops.

In Ghana, for example, in which more than one-third of those involved in agriculture are women (Wolf, 1977) the majority of women farmers are involved in subsistence agriculture (Tamakloe, 1978), but in Southern Ghana there are women cocoa farmers in Southern Ghana (Kali and Kotey, 1971; Hill, 1969) and rice farmers in the North (Gbedemah, 1978). Ghanaian women cultivating cash crops are constrained by their more limited access to credit and land ownership to relatively smaller farms than men and they tend to be less often literate

than men cash crop farmers (Gbedemah, 1978), a fact that can be expected to curtail their productivity (Lockheed, Jamison, and Lau, 1980).

In Botswana where male migration is high and female-headed households in rural areas may be as high as 43 percent of all households, women were found to be the main persons engaged in 48 percent of crop activities but to undertake most of the laborious and time consuming crop activities corresponding to 74 percent of all crop work. Men's primary tasks are land cleaning and ploughing and helping occasionally with other tasks (Bond, 1974).

In Tanzania where 51 percent of those involved in agriculture are women (Wolf, 1977), the large majority of women are farm managers (Fortman, 1979a). A detailed study of the National Maize Project, a production program which supplied subsidized inputs, showed that there were no differences between men and women farmers who purchased inputs from the program in terms of good maize practice scores, adoption of innovations or progressiveness. There were, however, significant differences in good maize practice scores between women (as well as between men) farmers who purchased and who did not purchase inputs from the program (Fortman, 1978; 1979b). Despite this evidence that women participants are as modern as men participants, women farmers made up only 8 percent of all participants. This much smaller participation of women farmers in the maize program can be well explained in terms of women's significantly lesser access to credit and agricultural information. It was found, for example, that women farmers received only 10 percent of the loans granted in a sample of six villages participating in the Tanzanian Rural Development Bank's Small Farmer Food Crop Loan Program (Fortman, 1978). And women who participated in the maize program had significantly higher information contact scores than women who did not participate in the program but agricultural extension agents were found to

visit women farmers much less often than men farmers (20 versus 58 percent). It seems, therefore, that when Tanzanian women farmers were visited by agricultural extension workers and were successful in obtaining credit, they were as innovative, knowledgeable and modern as male farmers but the probability that they were able to meet these conditions was much smaller than it was true for men farmers (Fortman, 1979 a).

In Kenya, 80 percent of the subsistence agricultural work is performed by women (State of Food and Agriculture, 1973) who either manage the farm land jointly with their husbands or by themselves because their husband has migrated to an urban area or because they are divorced or widows. In some districts of Kenya, the percentage of rural female-headed households and female-managed farms varies from 36 (Moock, 1976) to 40 (Staudt, 1978). In addition, women constitute 37 percent of the regular labor force and up to 90 percent of the seasonal labor force in coffee estates and a part of the casual labor force on tea estates (Conditions of Work of Women and Young Workers on Plantations, 1970).

An intensive study in Vihiga, a Kenyan division in which 38 percent of the farms are managed by women compared the productivity of women-managed farms with the productivity of men-managed farms. The results showed that women were more technically efficient maize farmers than men and that their productivity equalled men's. When women, however, had the same access to resources and opportunities as men, their maize output per acre was higher than men's (Moock, 1976). Another study from Western Kenya where also about 36 percent of the farms are managed by women, women managers' productivity measured in terms of crop diversification, time of innovation, and income-earning orientation equalled men's. This was true, however, only in an area with minimal agricultural services. In

another area similar in all respects except that much more agricultural services were available, women managers' productivity was less than men's because the agricultural extension agents visited women farm managers less often than men even when they were progressive in terms of crop diversification, income-earning orientation and early adoption of innovations. For example, about one third of women farm managers who adopt early agricultural innovations are never visited by agricultural extension agents while only three percent of men farm managers who are early innovators are similarly deprived of information. Also, the large majority of women (80 percent) with income earning farm enterprises receive only minimal services and only 4 percent of them receive several (4-5) services while five times more men with similar cash crops receive as many services (Staudt, 1978). The latter findings are extremely significant since they indicate that efforts to modernize agriculture in Kenya lead to the lessening of women farmers' productivity by making these modernizing efforts less accessible to them than to equally productive men.

The agricultural and economic abilities of Kenya were also proven in another study of Luo women who had to deal with reduced soil fertility in being able to have double cropping and more intensive agriculture. They proved to be quite capable in handling problems and in managing their labor in most productive ways while spreading the risks in more than one economic activity. They adopted labor-saving innovations in agricultural tasks and reinvested their labor saved in other economic activities, primarily trade (Hay in Spring and Hansen, 1979).

In Swaziland, the extensive migration of men to urban areas as well as to the Republic of South Africa has left 71 percent of rural women de facto heads of household and farm managers. Thus, 35 percent of women are involved in the

felling of trees and clearing the land, 75 percent in hoeing and 62 percent in weeding activities. When, however, a tractor is used because women are not trained to operate a tractor, they have to hire a man to operate it (The Survey of Roles, Tasks, Needs and Skills of Rural Women in Swaziland 1978/79, 1980).

Turning now to Asia, the highest percentage of women in agriculture (based on data from the late 60s) was in Thailand (50 percent), Cambodia and Nepal while the highest proportion of economically active women in agriculture (as wage agricultural laborers) were in Nepal, Malaysia, Thailand, Sri Lanka, India, Indonesia and Pakistan (Wolf, 1977). In Malaysia, 50 percent or more of the labor force on rubber estates are women (Heyzer-Fan in Ahmad, 1980). Survey studies in Bangladesh, where in many regions half of the rural households or more are functionally landless, show that the Census underestimates the percentage of women agricultural wage laborers since in most of these landless households women have no choice but to work (Begum and Greeley, 1979). In general, in Southeast Asia as the extent of landlessness increases, as is true for India (Majumdar, 1975), Indonesia (Collier, 1978), and Bangladesh (Cain, 1979; Clay, 1978), more women shift from the category of unpaid agricultural family workers to wage agricultural laborers.

In India, women's active role in agriculture varies widely from region to region and state to state according to the type of crops cultivated and the prevailing type of sex stratification system. Thus, in South India, parts of Central and Northeast India and the Himalayan region women comprise an important share of the agricultural labor force but a much smaller share in much of North India as, for example, in West Bengal where there is a taboo against women working in the fields (Mazumdar, 1975; Parmar, 1975). Overall, it is reported that 36 percent of all agricultural workers and 44 percent of all agricultural wage laborers are women (Fry, 1976), a Census figure which most probably represents a serious underestimation. More intensive surveys in specific regions and communities show that

more than half of the hired agricultural labor (ranging from 50 to 90 percent) in rural Maharashtra and Andhra Pradesh were women, their percentages being much higher when cotton and irrigation were prevalent (Ryan, Ghodake and Sarin, 1979). Similar trends have also been reported in Bangalore (Srikantan, Narayan, and Rao, 1978). Indian rural women have been affected by increasing landlessness even more markedly than men since from 1951-1971 the numbers of women cultivators declined by 50 percent while women agricultural laborers increased from less than one-third to more than half of the total women work force in rural areas (Mazumdar, 1975; Chatterjee, 1975). In areas, however, in which women are cultivators they sometimes perform 75-80 percent of all agricultural work and they are involved in cash crops such as cotton which are labor-intensive and do not require the use of farm equipment as is true in the rural areas of Hyderabad (Mies as reported in Ahmad, 1980) or in wheat production in Haryana where they perform more than 50 percent of the agricultural labor (Chakravorty, 1975).

In Latin America, the underestimation of women's active role in agriculture is extreme as the work of Deere (1975, 1977) has clearly shown in the case of Peru. Despite this serious underestimation, in Bolivia about 60 percent of the agricultural labor force consists of women. In the Caribbean islands, on the other hand, the participation of women in the agricultural labor force is high especially in Antigua (50 percent), Haiti and Monserrat (more than 50 percent), St. Lucia (47 percent), Barbados (40 percent), St. Kitts (45 percent) and Bahamas (30 percent) (Yates, 1980; Wolf, 1977).

Finally, in the Middle Eastern and North African region in which the underestimation of women's active role in agriculture is serious, recent trends of significant male migration to the oil-exporting Arab nations is drastically changing women's role in agriculture through the increasing incidence of rural

de facto female-headed households and women managed farms. In Syria, for example, already in 1969, 49 percent of the agricultural labor force were women (The State of Food and Agriculture, 1973) and in Jordan, Morocco and Yemen because of male migration the percentage of women in agriculture is reported to be almost as high (Staudt, 1979).

In summary, the above data on women's active role in agriculture in different countries and regions show that:

(1) Women play an active role in agriculture as agricultural producers usually in independent small holdings; as agricultural laborers; as farm managers; as unpaid family workers; as seasonal or permanent agricultural wage laborers; and as plantation workers;

(2) Women's agricultural contributions are not recognized in their own countries as well as internationally by donors, planners and policy makers partly because Census as well as surveys seriously underestimate their contributions and partly because of prevailing sex role stereotypes;

(3) In countries such as Bangladesh, India, and Indonesia in which the percentage of landless rural households is increasing, the number of women agricultural wage laborers is also increasing as women shift from unpaid family workers to agricultural wage laborers;

(4) Women's wages from hired agricultural work is so essential to the survival of landless and near-landless households that even strong cultural constraints about women's work are overlooked;

(5) Women farm managers are not exclusively involved in subsistence agriculture. To the extent that it is possible within the context of their inadequate access to agricultural information, inputs, and credit, they are also involved in cash crops production;

(6) When women farm managers have equal access with men to agricultural

information and inputs, they are as innovative and knowledgeable about correct agricultural practices as men;

(7) When the agricultural extension service is all male, even when women farm managers are involved in cash crops and are progressive they are less often visited by agricultural extension agents and receive less services than similar male farm managers;

(3) Women are actively involved in agricultural work in addition to their work-load consisting of household and childcare tasks.

Efforts to modernize agriculture in LDC's is taking place within the context of unrecognized significant agricultural work performed by women and within the context of large percentage of rural households' welfare depending upon the producer or agricultural labor activities of women. In view of the above information about women's agricultural role in LDC's, it is important to construct a working typology that would allow to design rural development and modernizing agricultural projects that would help increase the productivity of men and women agricultural producers and/or protect or increase both men's and women's incomes in rural areas. The proposed typology can serve to sensitize policy makers and project designers with regard to the realities of poor households in rural areas and can help them balance potential macro-level economic benefits for some segments of the population with potential economic losses for other segments of the population. For example, the impact of new rice husking technology on the incomes of middle and large size farmers must be examined along with its impact on the price of rice and its accessibility for low-income urban households and its negative impact on the income-earning ability of women in low-income rural households (Greeley, 1979). The proposed typology* utilizes

*A beginning for this typology based only on land and labor supply or abundance without taking the percentage of landless or the percentage of female-headed households into consideration was made by Germain (1980).

the following crucial indicators of rural areas in LDC's:

- labor scarcity or abundant labor supply;
- land scarcity or land availability and hence, percentage of landless rural households;
- percentage of female-headed households;
- availability of nonagricultural labor for rural men and women.

Diagram 1 presents schematically the typology. More specifically, when land is scarce but not labor as is true for several Asian (especially Southeast Asian) countries the percentage of landless or near landless is high and the percentage of women working as agricultural wage laborers also high, as we saw in the case of Bangladesh, Indonesia and some regions of India (Cell C).^{*} In this case, the majority of women are agricultural wage laborers, unless there are other income-generating opportunities for them in agricultural or
nonagricultural work.

If the majority of women work as agricultural wage laborers, efforts to modernize agriculture must take this into account so that planned crops are labor intensive and possibly multiple by means of irrigation and fertilizer technology and the introduction of agricultural technology that displaces female labor accompanied by labor absorption strategies. Such strategies may include the training of women laborers to operate the new technology as well as training in the new farming techniques required by high yield varieties and intensive, modern agriculture that could improve their chances to be hired as laborers as well as their agricultural wages; the formation of women's cooperatives who buy, lease, and operate the

^{*}Some South and Central American countries such as Brazil and Honduras would also fall in this cell, the former with a high percentage and the latter with a medium (25) percentage of rural female-headed households. In the case of Brazil, of course, landlessness is due not to absolute land scarcity but to a high degree of land concentration among few large landowners.

new technology; and the creation of nonagricultural wage employment for women. Another type of strategy that would help improve the working conditions of women agricultural wage laborers would be the development of appropriate technology that would render their agricultural work less physically taxing and more productive. At present, women in those countries work very hard, literally with their bodies while men work with machines and this increasing technological gap between men and women must be bridged, if development is to reach and benefit low-income rural women as well as men.

A further important differentiating factor in this cell of the typology (C) is the prevalence of female-headed households through migration of male heads, widowhood and divorce. In this cell, most of female-headed households would be landless and depending upon the women's wages from agricultural or nonagricultural labor thus underlining even further the importance of not only maintaining but broadening women's income-generating opportunities and of improving women's incomes through technical training. In the case of a high prevalence of female-headed households, another important development intervention would be the introduction of appropriate technology that would decrease the time spent in household activities such as, the availability of clean water in a near-by area, the planting of trees around the village for available firewood, or the availability of a primitive and simple means for transporting goods. Such interventions would tend to diminish women's work overload and to break the intergenerational poverty cycle (through which women's work overload is transferred on to their daughters) thus allowing young girls to attend school (Safilios-Rothschild, 1980).

Cell D in the typology includes rural regions and communities in Middle-Eastern and Latin American countries in which most or a large number of households

are near landless or have small holdings. In this case, in the Cell D in which the percentage of female-headed households is low, women are unpaid family workers and occasionally agricultural or nonagricultural wage laborers. Some of the same strategies with those proposed for Cell C would also apply here such as, the appropriate technology for making women's agricultural tasks faster, easier and more efficient, the need to train women in modern agricultural practices and technology and the development of nonagricultural income-generating opportunities for women. In addition to other labor using innovations that are advisable for both Cells C and D, the introduction of livestock and gardens to be attended by women would be an appropriate way to improve family nutrition and women's incomes as long as technical assistance and credit are at the same time available to women. Both of the latter conditions are facilitated through the training of women as agricultural extension agents who would tend to contact women more often than men have done up to now; the sex role awareness training of men agricultural extension workers to overcome their sex role stereotypes and prejudices about women farmers and the provision of occupational incentives for agricultural extension workers' contacts and service to women farmers; and the establishment of some type of women's collective organization that would allow women to be eligible for credit increasingly available to women's productive groups. In Honduras, for example, for the first time in the winter of 1981 the National Bank of Development made a small sum of \$250,000 available for loans to organized groups of women which had developed a specific plan of collective income-generating activities.

In regions and communities in which the percentage of female-headed households is high all the above strategies are the same only even more

urgently needed but in addition, appropriate technology that decreases the time-consuming household tasks of women are necessary in order to alleviate daughters of the cost they pay in terms of foregoing schooling in order for their mothers to be able to be actively involved in agricultural and other income-oriented tasks.

When, on the other hand, land is not scarce and the percentage of landless households is very low and labor is scarce as is true for many Sub-Saharan African countries (Cell B), the majority of women are either unpaid family workers and occasionally seasonal agricultural wage laborers or farm managers in small independent holdings. The prevalence of female-headed households further differentiates the type of roles played by women in agriculture, farm management prevailing when the percentage of de facto or permanent female-headed households is high as, for example, is true for many rural districts of Kenya, Botswana, Swaziland. Whether the percentage of female-headed households is higher or not since the majority of agricultural work for food as well as for cash crops is performed by women, a critical development strategy is the revamping of the existing agricultural extension service so as to provide women with agricultural information and services. This strategy is of course even more important when the percentage of female-headed rural households and women managed farms is high since otherwise agricultural productivity may be seriously hampered. This goal may be achieved by training more women agronomists and agricultural extension agents since there is evidence from Botswana that women agricultural agents are quite successful and very well accepted by male and female farmers (Fortman, 1978). But since the training of women agricultural agents

is a long term project, it is necessary to sensitize men agricultural agents by providing them with facts counteracting prevailing sex stereotypes about women farmers being less progressive and innovative than men.

not being able to understand as well as men the complexities of modern agricultural inputs and practices, and being less productive than men. Such a sensitization (awareness) training should be accompanied by a restructuring of occupational rewards so as to make contacts with and services rendered to women farmers (with small farm holdings whether they are managers or farm wives) a desirable and a rewarded behavior.

For rural areas in societies in Cell C, all types of labor-saving technology are both appropriate and beneficial as long as they save equally men's and women's labor. The same type of farm equipment that may displace agricultural laborers in societies in Cell B and create grave labor absorption problems, can be greatly beneficial in societies in Cell C. The introduction of rice-husking machines which are detrimental to women wage laborers in Bangladesh and Indonesia can be quite beneficial for women farmers in Sub-Saharan African countries since it frees them for other farming and marketing activities. When, however, labor-saving agricultural equipment is introduced that only saves men's labor, imbalances may occur in terms of women's work overload. The introduction, for example, of tractors has facilitated men's job of land clearance and has freed them to take advantage of nonagricultural wage labor but as much more land becomes available for cash crops in which women contribute their labor for the most time-consuming tasks, the lack of labor-saving technology that could make women's agricultural tasks faster and easier increases their already heavy work overload.

Similarly, the introduction of high yield varieties and/or crop diversification often results in more work for women (Carr, 1979). It is, therefore, essential that labor-saving technology for women's agricultural tasks are developed so they make women's work faster and easier and that women learn how to repair this technology themselves.

Furthermore, time budget studies in Sub-Saharan societies belonging to Cell B show that women have a heavy work overload because in addition to agricultural labor they have households and childcare responsibilities. In Upper Volta, for example, men and women spend equal total time in different food and cash crop productive activities but women spend much more time than men (3 hours versus 15 minutes) in food storage and processing, marketing and water and fuel supply activities with result much less time for personal needs or free time to visit and talk (McSweeney, 1979). In these societies it is, therefore, also crucial that labor-saving technology that decreases women's time spent in very time-consuming household activities such as, water and fuel supply and food processing is introduced in order to allow women to participate in modernizing agricultural efforts and be productive without their daughters paying the cost for their agricultural productivity (Safilios-Rothschild, 1980; Carr, 1979). The availability of clean water near by saves considerable time for the women in different communities of Kenya, they tend to use most of the time saved in farming (Whiting and Krystall, 1979). It is important, however, that when the use of pumps is necessary, that the women are taught how to use them properly as well as how to repair them so that their dependence on men for such repairs is not increased (Carr, 1979).

Regardless of the type of society, small landholdings, whether only

subsistence or mixed subsistence and income-earning oriented increasingly encounter greater difficulties surviving, especially as agriculture is becoming modernized. Many hard questions can be and have been asked about their viability or the desirability of their viability since they cannot afford the additional cost of modern agricultural inputs and have difficulties in competitively marketing cash crops because they cannot take advantage of scale economies which favor larger farms (Harrison and Shwedel, 1974; Palmer, 1972).

All modern agricultural and marketing methodology has been developed with larger farms in mind and increasingly economies of scale in personnel, equipment and distribution leads to the integration of the supply of fertilizers and pesticides to the supply of seeds controlled by very large multinational companies. The economic interest of these companies lies in the mass development of a few lines of seeds and packages of modern agricultural inputs based on the needs of large farmers rather than in trying to meet the diverse needs of small farmers who often have to cope with adverse environments (Palmer, 1972). It is, therefore, imperative that small farmers find ways to improve their viability by spreading the risks in nonagricultural as well as agricultural productive activities (Palmer, 1980) and that alternative ways to take advantage of scale economies are devised that would allow them to benefit from intensifying and modernizing farming. The most promising way for small farmers to take advantage of scale economies in the utilization of modern agricultural inputs and agricultural technology as well as in securing better marketing outlets is the establishment of cooperatives of small farmers only (Harrison and Shwedel, 1974).

The difficulties of small farms are many times multiplied when they

are managed by women and in this case, the cooperative way is probably the only way for women small farmers to survive and to be productive and even to some extent competitive with larger farmers. Here again a prevailing stereotype among policy makers and planners has been that women do not want and cannot work well with each other and, therefore, women's cooperatives will suffer from even more problems than all cooperatives of low-income rural people in LDC's. This stereotype, however, does not seem to be founded on facts. Even in countries such as India and Bangladesh in which there has not been a tradition of women's collaborative efforts, the establishment of women's rural cooperatives on a firm basis has been quite successful when certain conditions were satisfied such as, the establishment of cooperatives only for women so that they are not dominated by men as is true for mixed-sex cooperatives (Dixon, 1978; McCarthy, 1978; Greeley, 1979; Somjee and Somjee, undated). In India, it was found that the importance of all-women dairy cooperatives lay in the fact that it gave women the opportunity to learn managerial skills and to hold managerial positions but also in that productive cooperatives run entirely by women clearly establish the fact that the income is gained by women. This recognition that the income is gained by women helps them in turn control this income, dispose it and reinvest it without interference from their husbands (Somjee and Somjee, undated). Another important condition for the establishment of cooperatives which can successfully benefit and be controlled by low-income rural women instead of becoming dominated by women with larger farms is the requirement of contributions of physical labor for membership, a requirement not compatible with the higher status of better-off women (Greeley, 1979).

In Honduras, the organization of the Housewives Clubs by the Church helped make women aware that they could join forces and work together and

collectively increase their effectiveness and productivity and gave them some organizational and entrepreneurial skills. Even after these clubs were dissolved, rural women used their experience by initiating themselves or by readily responding to the promotoras sociales effort to organize them into collaborative groups. At present in many asentamientos created by the agrarian reform there are organized groups of women (usually with a president and a treasurer) with a variety of productive agricultural projects such as, sericulture, livestock, gardens and grain production. These groups of women have existed for a number of years, usually from the beginning of the formation of the asentamiento, and its members strongly identify with the group even when they have encountered great difficulties in obtaining technical assistance or credit to effectively realize their productive plans. In practically all of these groups, women have pulled together their very meager resources and in some cases, with little and only occasional help from promotoras sociales (and in a very few cases help from an agronomist) have been able to successfully launch a small productive agricultural project. The provision of technical assistance and credit to these already formed and functioning groups of women could increase by many times productivity and improve low-income women's (and their family's) income as well as nutritional status.

In most Sub-Saharan African countries, there is a long tradition of women's associations and groups for a variety of purposes from social to economic. The most frequent type have been self-initiated rotating credit groups in which the women make regular contributions to a fund which is given to one of them in rotation, except in case of emergency when a woman is given priority in the distribution (Lewis, 1976). Similar rotating credit groups can be found, however, in Korea included in the "Mothers'

Clubs", in Malaysia ("Kootoo" or "Tontin") and Indonesia ("arisan") (Buvinic, Sebstad and Zeidenstein, 1979).

In some Sub-Saharan African countries, rural women's groups and associations have undertaken specific productive or marketing purposes as is true, for example, for Ghana and Kenya and have become cooperatives or officially registered groups eligible for technical assistance from the government. In the 1978 Legon Conference on Women and Development, it was reported that in Northern Ghana women agricultural laborers are organized in work gangs with a woman as a gang leader who negotiates their wages and other work conditions. In Kenya, rural women in several areas have successfully organized into officially registered groups and have made the significant step toward a truly collaborative productive investment of their pooled resources over time rather than the individual use of pooled resources over a short time.

In the Mraru rural area in Kenya, for example, women from several villages organized to form a club, pooled their resources together and managed to buy a bus to transport goods to the market. They were extremely successful in securing loans in order to buy it and later on in reinvesting and diversifying their productive investments in goats and in a store as well as seeking and securing governmental technical assistance and hired professional expertise (Kneerim, 1980). A very important feature of this cooperative undertaking was the fact that the productive investment and the resulting profits were collective thus, allowing women to take advantage of scale economies rather than using pooled resources for individualized productive projects which tend to be much smaller and, hence, much more vulnerable.

There is, however, another level of collective cooperation between women's groups and cooperatives which has not been sufficiently experimented yet, namely the horizontal and vertical integration of women's cooperatives

and organized groups. Horizontal integration would involve the cooperation between same type women's productive, credit, or marketing organized groups or cooperatives in the same district, state or region possibly leading to national representation and influence. Thus, horizontal integration of same type women's collectivities allows them to maximize the benefits from scale economies, to increase the scope of their undertakings and, therefore, their access to governmental technical assistance, credit and training opportunities as well as their power within their communities and their ability to participate in the political decision-making. Vertical integration would involve the cooperation between different types of women's organized groups or cooperatives including rural women's productive collectivities, women's groups or cooperatives serving as middlewomen between rural production and marketing in the urban areas, and urban women's marketing cooperatives. This type of integration would allow rural women to avoid the exploitation on the part of middlemen and to increase their profits by better responding to current and changing market demands and requirements (Lele, 1981). Vertical and horizontal integration of women's collectivities would make it possible for women to truly become integrated in the development efforts of their countries and to become a powerful voice in development planning.

Women's bureaus and women's national associations could play a crucial role in facilitating, in experimenting with a variety of ways and in evaluating attempted schemes of horizontal and vertical integration of women's groups and cooperatives. Their role, however, would have to be one providing an expertise, stimulation, and facilitation rather than a leading role in that they would have to be willing to train women from rural and urban cooperatives to become leaders and representatives of their coalitions. Despite this, the channelling of the efforts, talents and funds of women's bureaus and associations in this

direction would be much more productive and effective than in the direction of proliferation of small productive projects for rural women.

In concluding, it is important to underline that the extension of agricultural, technological and cooperative training, agricultural credit and agricultural information and services to women; the development of appropriate technology that can decrease time spent by women in household duties and of appropriate technology that can make women's agricultural labor faster, easier and more productive; and the maintenance as well as broadening, mainstreaming, and improvement of rural women's agricultural and nonagricultural income-generating opportunities are essential for several reasons. Namely, they are important in order to: (a) increase agricultural productivity; (b) increase the income and food availability especially to low-income rural households; (c) diminish existing and widening social inequalities between larger and smaller farmers as well as the landless (since the prevalence of the second category is usually much higher among rural female-headed households); (d) diminish existing and widening sex inequalities between male and female farmers and male and female agricultural laborers; and (e) help retain women in rural areas and in land cultivation and diminish the accelerating rate of female rural-urban migration resulting from the unrewarding, harsh and unaided struggle of women to make a living from agriculture for themselves and their children (Palmer, 1980; Chaney and Lewis, 1980).

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DIAGRAM 1

		Land Scarcity (High Percentage of Landless)		No Land Scarcity (Low Percentage of Landless)	
		Percentage of Female-Headed Households		Percentage of Female-Headed Households	
		High	Low	High	Low
Labor Scarcity	A	I	II	B III Kenya Botswana Swaziland	IV Upper Volta Mali
	C	V Bangladesh Brazil Jamaica	VI India Indonesia Honduras	D VII Syria Morocco Jordan	VIII
High Labor Supply					