GENDER ISSUES AND SOCIO-ECONOMIC RESEARCH IN KARI

Mid-term Evaluation of the USAID NARP II Project

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I. Introduction

An evaluation of attention to gender issues in the design and implementation of the National Agricultural Research Project II involves two approaches: an appraisal of attention to gender concerns in the organizational and personnel structure and functions of KARI as an institution; and the incorporation of gender issues in the socio-economic applied research activities designed to increase the effective dissemination of new agricultural technologies to the farming population. Of these two dimensions of gender issues, the second will be treated in more depth.

II. Background: The Importance of Gender in Kenyan Agriculture

The crucial role of smallholders and of women in Kenyan food crop production has been amply documented in recent years. Thus, some 85% of Kenyans live in rural areas, depending in large part on agricultural production. Small farm holdings account for about 75% of total agricultural output, including major cash crops and food produced for own consumption (Ayot, 1, 1993).

About 75% of labor on small farms is provided by women. Some 96% of rural women work on the family farm, compared to 80% of men (Ayot, 1, 1993). Up to 47% of Kenyan small farms are managed by women, and women are key participants in the operations of the remainder (Kimani, 3, 1990). It can be safely said that it is women who produce the great majority of Kenya's food and are increasingly involved in cash crop production, where they provide 80% of the manual labor input (Odinga, 2, 1993).

It is now well known that single women managing households may constitute 25% of all Kenyan rural households, but only about 5% of women in Kenya own land in their own name (Ayot, 2, 1993). Ownership of other fixed assets and livestock, even small ruminants, is normally the purview of men, even if away in urban areas.

The increasing recognition of women's key economic roles in development projects led to the formulation of policy guidance within USAID beginning 20 years ago. The policy message

has consistently been on both economic efficiency and on equity of opportunity and benefits.

Nowhere in the world do women play a more important role in agriculture, particularly food crop production, than in Africa. Full discovery and integration of women's concerns into development projects is not just desirable; it is essential to success. It is with this concern in mind that USAID approached the Phase II of its National Agricultural Research Project in 1992. The importance of socio-economic analysis within the farming systems research and extension methodology and of the integration of gender issues within project-funded activities was made amply clear in project documentation, as USAID envisaged the second phase of its support to the Kenya Agricultural Research Institute (KARI).

III. USAID Attention to Gender and Socio-economics in NARP II

The USAID/Kenya contribution to the program of agricultural research activities under the restructured Kenya Agricultural Research Institute was premised on building a sustainable, client-oriented research system responsible for providing the agricultural sector with the means to increase productivity on a continuing basis. The generation of appropriate technologies, particularly for smallholders, and the use of farming systems methodology has been of paramount interest to USAID, especially in the NARP II project. Thus, one of the four "end of project status" indicators listed in the NARP II project paper amendment is:

> "KARI having an applied farming systems research system in place and functioning which assists with the establishment of research priorities through farmer interaction, tests new technologies under on-farm conditions and facilitates the dissemination of production packages through the extension system (USAID/Kenya, 7, 1992)."

The focus on farming systems research and extension was stressed in the project paper amendment by the inclusion of a covenant requiring that KARI would have within 6 months of project start-up "an adequately staffed and functioning socio-economics unit with responsibility for research policy guidance and monitoring and evaluation functions (USAID/Kenya, 31, 1992)."

The social soundness summary (pp.38-39) and full analysis (Annex C) place considerable emphasis on women farmers as the key clients of Kenyan agricultural research and extension. Given that one-third of farm households are female-headed, that women are the majority of the agricultural labor force throughout the country, and that they are responsible for food crop production in particular, including small-scale horticulture, the project paper states that "special attention will need to be given by KARI's socio-economists to how new technologies are impacting different groups in the population." The social soundness summary goes on to say:

> "The strengthening of KARI's capabilities in the area of socio-economics and the incorporation of the farming systems approach into KARI's adaptive research effort is an important investment that will help insure that the interests of all Kenyan's are kept in mind during the research process (USAID/Kenya, 38-39, 1992)."

The full social soundness analysis devotes considerable attention to the need for improved linkages between research and extension and the desirability of meaningful farmer consultation. With regard to such consultation, it is stated that "since the majority of small scale farmers in Kenya are women, extension services need to deploy more women than they do at present (USAID/Kenya, C-7, 1992)."

Gender issues are specifically addressed in a section of the social soundness annex (pp. C 10-12). Noteworthy among the statements made there is:

> "Field day attendance indicates that women are always in the majority and, therefore, are quite receptive to extension advice. This means that women are the most appropriate link between research and extension (USAID/Kenya, C-10, 1992).

Some of the key gender issues to be addressed under NARP II are:

- The central roles of women as small farm managers, workers, and food producers require that a representative proportion of women farmers be recruited as cooperating farmers.

- Since women farmers are less likely to give reliable information to male extension workers, a majority of women extension officers should be employed in research-farm linkage activities.

- The impact of new agricultural technologies on women's labor load and time should be monitored because of women's dual workload (household maintenance and food crop production).

- The use of the Agricultural Research Fund should be monitored to ensure appropriate attention to women's needs, including the use of sex-disaggregated data collection, examination of the constraints and opportunities for increasing women's participation, inclusion of strategies to enhance women's involvement, and benchmarks to measure progress toward more fully including women in research activities.

IV. Gender Issues Within KARI as an Institution

Women among KARI Staff and in Decision-making Positions

KARI employed 5,300 employees in April, 1995, down from 5,973 in mid-1992. Of these 1,222--or 23%--are women, up from 21% (1,254) in 1992 (Westley, 6-7, 1992). Personnel cutbacks in KARI over the last three years appear to have overwhelmingly fallen on men. A similar percentage--21%--of top-level personnel (job categories J through S) were women in 1994 (see Table 1), down from 22% in the same grades in 1989 (Lodiaga and Mbevi, 36, 1995). Although women occupy the senior personnel grades (J through S) in about the same proportion as their overall percentage of total employees, the highest decision making posts

are virtually all held by men. Of the highest managerial positions, including the Director, deputy directors, and the national and regional center directors and deputy directors, there is only one woman, acting director of the Kisii center. The latter has not yet been confirmed in her post. On the other hand, four assistant directors of 11 at headquarters are women (human resources, animal production, horticultural and industrial crops, and administration).

Table 1

Top Level Personnel of KARI by Sex and Job Group

Job Group	1988-89 #		1988-89 %		1993-94 #		1993-94 %	
	M	F	M	F	M	F	M	F
S	1	0	100	0	1	0	100	0
R	4	0	100	0	3	0	100	0
Q	16	4	80	20	24	3	89	11
P	16	1	94	6	54	7	89	11
N	46	7	87	13	2	1	67	33
M	244	60	80	20	239	65	79	21
L	139	54	72	28	165	73	69	31
K	164	31	84	16	146	19	88	12
J	245	95	72	28	266	72	79	21
Total	875	252	78	22	900	240	79	21
Grand Total	1127		100		1140		100	

Source: Lodiaga and Mbevi, 1995.

Of the 507 research officers of various grades in KARI (BSc. or above), 112--or 22%--were women in April, 1995. This is the same proportion found in 1992 (Westley, 7, 1992). The percentage of women among research officers in KARI is slightly higher than the proportion of women scientists (19%) graduating from Kenyan universities (Westley, 9, 1992). Thus, KARI appears to be hiring women scientists roughly in proportion to their number among total scientific degree graduates.

However, the proportion of women among research officers drops fairly rapidly in the upper grades (see Table 2). While women constitute 28% of the bottom two grades taken together, they are only 21% of staff at Research Officer I, and but 12% of the top three grades.

Table 2

Percentage of Women as Research Officers in KARI

Grade	No. Women	No. Men	% Women
Chief Research Officer	0	3	0%
Principal Research Officer	1	5	17%
Senior Research Officer	6	42	13%
Research Officer I	60	232	21%
Research Officer II	31	72	30%
Assistant Research Officer	14	41	25%
Total Research Officers	112	395	22%

Source: KARI, 1995.

A clear majority of men is also found among administrative officers, although a woman is chief administrative officer. Among her staff at grades from Administrative Assistant through Senior Administrative Officer, only 8 of 47--or 17%--are women.
Among the numerous technical personnel from technical assistant through senior technical officer, male employees continue to dominate beyond their overall proportion of KARI staff. Thus, only 124 of 739 employees--or 17%--of this group are women.

On the other hand, among the secretarial staff, all but three of 131--or 98%--are women. Interesting, among clerical officers only 90 of 324--or 28%--are women.

Status and Advancement of Women in KARI

In conversations with women in KARI headquarters and in the research centers, the basic opinions offered for the relatively reduced level of women in the institute, especially in decision-making positions, echo those presented in a study by Lodiaga and Mbevi on the status and advancement of women professionals in Kenyan public institutions. This study covers KARI, as well as KENGO, KEFRI, Ministry of Agriculture and Livestock Development, Ministry of Environment and Natural Resources, and the public universities (Lodiaga and Mbevi, 1995).

The findings of this study cover the various institutional and externally-based constraints to women's status and advancement found in KARI and similar public sector institutions. These are grouped into the following: recruitment procedures; promotions and training; working environment; decision making bodies; and external socio-cultural factors.

Schemes of service exist in KARI based on the Occupational Schemes of Service of the Kenya National Occupational Classification issued by the Ministry of Labour and Manpower Development. These schemes of service, governing recruitment, terms of service, promotions, and staff development, appear gender neutral. However, since no provisions are made to distinguish male or female staff needs, the assumption is made that there is no distinction in status and roles between male and female employees and the special needs one or the other sex may have. Apparent gender neutrality tends to hinder recognition of the social and institutional constraints women face during their careers.

These constraints stem primarily from social perceptions of women's roles and fundamental nature. During recruitment, for example, women are often asked questions about their family situation, children's ages, and potential conflicts with husband's career. Women's dual roles--working professional and mother/housewife--are rightly recognized, but wrongly allowed to constitute constraints to equality of employment and advancement.

Stereotypical views of women's nature also hinder recruitment or promotion to positions of authority and responsibility within public institutions. Women tend to be regarded by both men and women as less suited to such positions. Furthermore, women who do successfully establish themselves in high decision making posts are often described as having adopted masculine behavioral attributes.

Explanations given in this study on Kenyan public institutions for women's difficulty in gaining promotion equally with men are:

- Reduced career choices at inception and in the workplace
- Need to defer to husband in career planning and choices
- Fewer opportunities for career advancement
- Inadequate academic qualifications
- Conflict between roles of housewife and professional
- Lack of self-confidence

- Undeveloped negotiation skills

However, data from the Lodiaga and Mbevi study for KARI indicate that between 1988 and 1993 women were promoted among job levels J through S approximately in proportion to their percentage of total employees at these levels (Lodiaga and Mbevi, 102, 1995). Thus, some 25% of personnel promoted at these levels were women, compared to the 21% to 28% of these posts they held during the 1988 to 1994 period (see Table 1).

Women are a small minority of the executive boards and committees of agriculture-related public institutions, including KARI (Lodiaga and Mbevi, 54, 1995). At KARI the Management Board and the Tender Board contained no female representative in early 1995. On the other hand, the Staff Advancement Committee counts 2 women among its 7 members (29%), about equal to the proportion of women among total KARI staff in April, 1995 (23%). On the other hand, the Financial and Administrative, Technical and Research, and Housing Committees have no female members (Lodiaga and Mbevi, 63, 1995).

The situation in KARI is comparable to the position of women in the agricultural commodity boards, where women are found only in the managing committee of the Horticultural Crop Development Administration (2 of 9 members). Boards where no women are found in management committees are: Cotton Board, Dairy Board, KMC, Kenya Bixa, Tea Board, Kenya Veterinary Vaccines Board, Pyrethrum Board, Kenya Sisal Board, KTDA, N.C. and Produce Board, Coffee Board, and the Agricultural Finance Corporation (Lodiaga and Mbevi, 61, 1995).

Training

In regard to training opportunities women are often passed over, because it is felt that their first priority is to the family and household needs. Long-term training overseas or grade promotion involving change of work location are often felt to disadvantage women, because of women's tendency to avoid causing hardship to husbands and children. However, discussions with professional staff in KARI centers did not always confirm this perception, particularly with regard to change of workplace within Kenya.

Another constraint to training for women lies in their general unequal access to information networks in large organizations such as KARI and to their reduced social and political mobility with regard to men. Much training selection is done informally, which disadvantages women in the majority of cases, since most decision making posts are occupied by men. KARI and similar institutions make no special provisions in training schemes for women, in spite of recognition that women face family constraints. Thus, unequal opportunity for long-term training tends to accentuate the difficulty women have in achieving higher grade levels in public institutions.

Training under USAID NARP I and II

Women have been 10 of 75--or 13%--long-term or short term (1) trainees under the MIAC contract during NARP I and II. A slightly higher percentage of women among the total were

sent during NARP II--6 of 34, or 18%--compared to NARP I--4 of 41, or 10%. Four women were sent for Ph.D. training, 6 for the MSc. Women have thus constituted 4 of 26, or 15% of Ph.D. candidates and 6 of 48, or 12.5% of MSc. postulants.

Women have been under-represented in long-term training under the USAID NARP I and II project phases. Thus, women were 13% of total participants compared to 22% of current research officers. Moreover, women compose at present 28.5% of the bottom two grades within this group, the level from which most trainees would have been selected. Although it is not known what proportion women held of research officer posts during the early years of NARP, it is not likely to have differed substantially from current levels (cf. Table 1). The conclusion is that the proportion of women sent for long-term training was perhaps half of what it should have been had candidates been selected in a proportional manner.

Socio-cultural Origins for Gender-based Discrimination

The undeniable under-representation of women among long-term degree trainees and in the highest decision making roles in KARI and other public sector institutions concerned with agricultural development in Kenya, is nothing new, nor does it reflect conscious barriers constructed by misogynists in positions of authority. It is rather rooted in the fabric of Kenyan tradition, in the socially defined roles and responsibilities of males and females in society.

In the organic concept of how society should be organized between family and professional life, most men and many women see women's first role as "pillar of the family," that is women must balance professional career with household reproductive, childcare, and maintenance responsibilities, while men's first duty is to the external career. In addition, to this socially defined division of labor, women's roles are defined generally as less important than men's and their professional activities in the public sphere are deemed subsidiary to their true vocation, maintaining the household and as primary educator of children.

Male perceptions of social roles between the sexes tend to prevail in Kenyan society, and the effort required to recognized women's aspirations to advanced education, decision making roles in the public sphere, and well-paying jobs and career paths is often misunderstood by men or even resented. Thus, gender neutral policies in KARI and in other public institutions may not serve to overcome social barriers which discriminate against women from childhood.

In the interviews conducted by Lodiaga and Mbevi in KARI and other related public institutions, fully echoed in conversations during the evaluation of the USAID NARP II project, the subtle and overt barriers holding women back from equal professional lives with men begin in the socialization process within their families of origin. It is here that their self-esteem is often eroded; this is particularly the case with respect to a technical or scientific education, so valuable to getting ahead in KARI.

Beyond family attitudes, values, and the socialization process, the education of women resembles a weeding out process in which girls are removed first from schooling than boys. The withdrawal of girls from school may also result from women's labor need on the farm, as

new labor-intensive technologies are introduced through agricultural research efforts. In one research center KARI staff members stated that there was no "opportunity cost" for household labor, since it appeared to be highly elastic in availability (high underemployment). Premature removal of children from school, especially girls, can be a hidden gender issue is the labor supply response to new on-farm technologies.

Women interviewed by Lodiaga and Mbevi in KARI and elsewhere also complained of marginalization in the workplace and male belief in female inferiority, which tended to undermine women's own self-confidence over time. Many women report they are excluded or disregarded during meetings or that their opinions are obviously undervalued (Lodiaga and Mbevi, 64, 1995).

Men are also generally unwilling to take orders from women, it was reported in conversations with women within KARI. Most men, but not all, feel threatened by a female supervisor.

Fundamentally, the roles associated with men and women cause uncertainly among women when they push for career advancement. Many have had to struggle against unspoken or overt social attitudes tending to equate women's success in life with raising a successful family and supplying a tranquil home environment to a husband, relieving him of a large part of the domestic friction capable of slowing his career competitiveness.

While both men and women tend to appreciate the time and energy conflict in women's domestic and career roles, the idea of special provision for women's needs in order to accommodate both roles appears fanciful, even threatening to men. When it comes to taking compensatory action, men and many women prefer to recognize male priorities in career advancement.

As Lodiaga and Mbevi put it in their study of women in KARI and related public institutions:

> "Femininity as constructed within these institutions does not encourage achievement or ambition either in the job market or academic world. Instead it directs women to external goals of being a good female companion to men. Hence, many go searching for emotional and personal fulfillment in domestic life and motherhood. They, like others, judge academic achievement or success as unfeminine on the assumption that those who perform well do not find husbands or boyfriends and therefore will fail as women (Lodiaga and Mbevi, 70, 1995)."

To the common Kenyan expression that behind every successful man there is a women, one male respondent rejoined that "behind every successful woman, there is no man (Lodiaga and Mbevi, 70, 1995)."

V. Gender as a Component of Socio-economic Work Within KARI

A. Background to the Socio-economics Division

KARI has had some socio-economists among its staff since its inception in 1986, inherited from the farming systems emphasis in agricultural research beginning in the late 1970's. These socio-economists, however, never constituted a separate organizational unit until the increased emphasis given to this discipline in the last few years. Their work until recently was thus subordinated to the immediate research needs of the bio-physical scientists and tended to involve economic evaluation of bio-physical experiments. Only recently have their efforts begun to include diagnostic work at the farm level, intended to inform the planning of future agricultural research. It was because of the marginal position of socio-economists within KARI and the low retention rates of those hired over the years, that KARI management has now placed emphasis on increasing the number of socio-economists and creating a new division of Socio-economics under the Deputy Director for Research. This effectively raises the status of the socio-economic group from part of the monitoring and evaluation function to bona fide research.

B. Functions of the Socio-economics Division

The socio-economic group in KARI headquarters and in the research centers have three programmatic thrusts: assistance to technology development and dissemination; impact assessment studies on technology dissemination; and policy environment studies. It is recognized by the socio-economic group that gender will be a major cross-cutting dimension of the activities of the division.

The focus on socio-economic analysis in the process of technology development and dissemination will be the backbone of the overall program. There are two ways the division intends to inform this process and build a socio-economic dimension to the bio-physical research program. The first is top-down: the process of research priority setting, conceptualization, development, and final dissemination. The second flows from farming systems research and extension: diagnosis at the farm level, feedback into the research conceptualization process, extension, and final farmer adoption.

<u>Socio-economic Information in Priority Setting</u>

KARI is currently engaged in setting its future research priorities, beginning first with the development of methodology, institutions, and processes at the central level, then moving down to the centers and eventually to the level of individual research experiments. Priority setting at the program level is to set the framework for all future research activities. Evaluation of such activities will involve the following criteria: potential for increased yield per unit area; potential for increased acreage on a sustainable basis; and potential for increased adoption rates. Priority setting in the process of adaptive research based on farm-level problems will focus on identifying homogeneous technology impact zones. These zones will be defined taking into account farmer perceptions of constraints to production. Since these farmers are predominantly women, gender issues will be a constant theme in adoption

analysis.

Socio-economic Information in Developing and Disseminating Technologies

The characterization of production systems will include socio-economic factors and perceived constraints to raising production. The socio-economic dimension must then be integrated into the bio-physical characteristics of the farming system.

The work of socio-economists will be to identify farmers by socio-economic type and target them for appropriate technology packages designed to alleviate production constraints. Target groups, or clients, will be distinguished by important variables, such as resource endowment, level of capital investment, scale of production, and purpose of production (Mbabu, 5, 1995). Here again, gender analysis will be crucial to distinguish women's and men's differing constraints and opportunities.

The process of characterization of production systems, involving delineation of bio-physical and socio-economic characteristics, will permit the identification of specific production constraints including both production and marketing. To the degree possible, socio-economists will quantify the variables involved.

Constraints to increasing production will include both social and cultural factors, as well as those dealing with the production functions of various factors. Thus, land tenure, credit practices, wealth accumulation and disposal, sources of family income, and consumption characteristics should be taken into account in analyzing the farming system. These will all have a gender dimension, requiring collection of sex-disaggregated data.

The availability and disposal of family and local labor should be particularly studied. Women's time constraints because of general reproductive and household maintenance duties are of particular importance here. The is generally understood by the socio-economists, but should continue to be stressed in future work. The constraint to expanding women's labor in crop or livestock production may involve the introduction of labor-saving technologies for household maintenance, such as improved stoves.

The use of on-farm trials will enable KARI to judge the effectiveness of the technologies it has developed, but these trials must also involve the monitoring of socio-cultural and economic factors. Two concepts are key here: economic viability and social acceptability (Mbabu, 6, 1995). The bio-physical performance of new technologies will not be sufficient to judge eventual adoption rates at the farm level without understanding social and economic factors of the farm families. Again, this means taking a holistic view of the lives of the farm managers and decision-makers, overwhelmingly women. It is the overall characteristics of women farmers that will determine the success or failure of new KARI technologies.

As important as integrating social and economic factors into the research conceptualization, planning, and implementation process, is the feedback from on-farm study of production systems, constraints identification, and actual on-farm trials. Feedback of results to the planning process in a timely manner must include accurate information on farmer behavior in

Centre for Women Studies and Gender Analysis at Egerton University.

C. Composition of the Socio-economics Division

Currently, the staff capacity of socio-economists within the whole of KARI is 54 KARI staff and 5 donor-funded contractors. The headquarters staff in Nairobi has 15 KARI staff, including 4 donor-funded contractors. The head of the unit is funded under the USAID MIAC project under NARP II. Others expatriates are funded under ODA and Rockefeller Foundation.

The national research centers contain 27 socio-economists, without contractors, while the regional research centers have 17, including one expatriate contractor. Of these 59 socio-economists, only 21 have the educational qualifications for a research scientist at KARI, the MSc. or Ph.D.). This includes the 5 contractor personnel, generally known as expatriates, whether Kenyan or foreign. Nine socio-economists are currently in training at the MSc. and Ph.D. level, bringing the number to 30, if the expatriate staff is maintained at its current level.

It is projected that each of the 17 national centers and the 11 regional centers should have a socio-economist researcher, plus 6 senior socio-economists at KARI headquarters to provide overall support, guidance, and coordination to the whole system. This will require the provision of at least 4 more graduate-degree holders to KARI in coming years.

The interdisciplinary mix of socio-economists is skewed toward agricultural economics. Of the 21 graduate-level socio-economists, 20 are trained in agricultural economics and only one in sociology, although the latter is the head of the Socio-economics Division (but not officially acting assistant director, since he is a Kenyan contractor under MIAC).

All socio-economists in the KARI system are considered to belong to one group, although they also must fall under the authority of their individual centers. In this way, the senior and junior level socio-economists will be in close contact and assist each other financially and conceptually. The leading role in this coordination will be from the headquarters unit of senior researchers under the Assistant Director for Socio-economics, but the actual on-farm research will be carried out largely by the 28 socio-economists and their staffs in the field centers. Given the small size of field units, these socio-economists will have a heavy workload to provide the information flows and socio-economic impact monitoring expected of them in future.

Socio-economists will need to be numerous enough to work alongside bio-physical scientists and conduct their own specific research independently. They will be called upon to inform proposals and decisions at all levels of KARI activity: program planning and priority setting; project formulation; implementation; monitoring and evaluation; and impact assessments. To inform decision-making, socio-economists will have to continuously track numerous social, cultural, and economic variables at the farm level. The incorporation of a social science perspective, including relevant gender analysis, into KARI research management and experiments will not be an easy task.

the use of these technologies. It will serve no useful purpose to identify well-performing varieties, if the farm population does not wish to adopt them on a regular basis. The monitoring of representative target groups, including women's production associations, will allow generalization to wider populations. This process should employ the concept of PRA, or participatory rapid appraisal, and take special care to include women in proportion to their number in farm management.

Impact Assessment

Beyond the evaluation of bio-physical outputs from research experimentation, impact assessment of KARI programs will focus on actual people-level impact of new technologies. Such people-level impact, important to USAID in particular under the Development Fund for Africa (DFA), should involve indicators at both production and consumption levels. Moreover, these data should be disaggregated by gender.

Several types of people-level impact studies are to be used by the socio-economists at KARI: ex-ante, on-going, and ex-post studies. Ex-ante evaluations attempt to calculate potential production and income gains to producers and consumption levels by consumers, in order to inform priority setting of research activities in the various centers. On-going impact assessment will be undertaken during implementation of research activities, and will focus on-farm trials of proposed technologies, as well as continuing to monitor the use of socio-economic information in the development of these technologies.

Finally, ex-post assessment is undertaken to examine actual adoption rates of new technologies and their rate of diffusion among the overall client group targeting by the research program. The results of these studies should feed back into the development of improved strategies for the future.

Policy Environment Studies

Socio-economists in KARI will also be expected in future to monitor the policy environment, or as it is sometime called, the enabling environment for the development and adoption of new agricultural technologies. These policies should not be just economic; policies on inheritance and land tenure, on collateral for credit, and on provision of social services to rural areas are all important in gauging potential for increasing smallholder production. This is all the more true, because of women's preponderant role in Kenyan farming systems, particularly food crop production.

Partnerships should be encouraged between KARI and a variety of other institutions involved with research on agricultural policies, such as the Policy Analysis Matrix group (PAM) at Egerton University, planning divisions of the Ministry of Agriculture, Livestock and Marketing, and of the Ministry of Planning and National Development. In view of women's key production and management roles in small-scale food and cash crop production in Kenya, involvement of KARI socio-economists should also be envisaged not only with the numerous local women's groups, but also with national institutions, such as the African Women Leaders in Agriculture and Environment (AWLAE), sponsored by Winrock International, and the

D. Current Functions of the Socio-economists in KARI Centers

Most of the KARI research centers have one or more socio-economists on staff. With the exception of Kitale, whose socio-economist was on leave to obtain his MSc. in Agricultural Economics at Nairobi University, all centers visited had from 2 to 4 socio-economists.

These socio-economists, overwhelmingly agricultural economists, are currently responsible for spearheading the linkages between research activities at KARI, the extension services, and farmer beneficiaries. They are quite aware of the importance of gender issues, which they claim to incorporate fully into their work. However, while socio-economists are responsible for gathering the socio-cultural and economic data necessary to inform research priority setting and success in farmer adoption, farming system outreach teams always include bio-physical scientists. Other staff closely linked to farm-level activities are the food technologist/nutritionists, responsible for gauging farmer perceptions of suitability and acceptability of new food products in the family diet. Most of the panelists consulted by these technicians are women, who are responsible for preparing household meals. Food technologists tend primarily to be female home economists, trained at Egerton University. Only this year, apparently, has Egerton begun to graduate male home economists.

Intensive interviews with socio-economists at Katumani, Thika, Embu, Kakamega, and Mtwapa research centers revealed very similar perceptions of their roles and activities within their centers. Nearly one-third (32%) of the 56 socio-economists, excluding expatriates (but including the MIAC contractor, head of division), are women. This is substantially above their proportion overall among KARI staff (23%).

Until recently socio-economists primarily provided a variety of economic or socio-economic services to the bio-physical scientists, without a research agenda of their own. With financial backing from various donor agencies, including USAID through the MIAC contract, socio-economists in the centers now have a variety of diagnostic and impact studies under way. These include the various socio-economic studies specified in the MIAC Year 3 Action Plan. While few socio-economic research reports appear as yet complete, and not all centers are conducting all studies, these applied research efforts include:

(1) Farming Systems Diagnostic Surveys (PRA)
(2) Maize Database Survey
(3) Nutritional Monitoring Survey (NUTMON)
(4) Maize and Sorghum/Millet Impact Surveys
(5) Crop Technology Adoption Surveys
(6) Maize and Sorghum Yield Gap Surveys
(7) Ex-ante Horticultural Survey
(8) Ex-ante Maize Credit Survey
(9) On-farm Trial Results Monitoring
(10) Livestock Reconnaissance Survey
(11) Small Ruminant Impact Study
(12) Maize and Horticulture Characterization Studies
(13) Horticulture Database Survey

(14) Informal Credit Study

E. Gender Awareness and Analysis Among the Socio-economists

Gender Issues Task Force

Recently, the Socio-economics Division within KARI headquarters created the Gender Issues Task Force chaired by Ariel Mbabu, Division Chief. The task force groups nine Kenyan and expatriate KARI staff and outside members, including Charity Kabutha of African Women Leaders in Agriculture and Environment (AWLAE), Maria Mullei, NARP II project officer in USAID, and Socio-economic Division members Ariel Mbabu, Loise Wambuguh, Anni McLeod, and John Curry. Margo Kooijman is also an active member under the Dutch project at Katumani. At a recent meeting of the group (June 11), the outline of future activities was agreed upon. The first activity to be launched will be a half-day, consciousness-raising workshop for KARI senior management, including national program coordinators, but not center directors. The latter would be reached later in the centers.

A tentative date of July 27 was selected for this first event. The Dutch would fund the gathering. The workshop would be facilitated by Charity Kabutha of AWLAE and be similar to the presentation she made to the Gender Issues Task Force at its inception. At this workshop the conceptual framework and rationale for gender awareness and analysis within KARI will be communicated to managers. The outcome sought will be consensus on basic terminology and concepts.

Following this workshop the Gender Task Force will set about organizing a similar event in major centers, with the expectation that all centers would eventually hold a half-day seminar. One or more consultants would be hired under donor funds to tour the various centers using materials developed in the senior management seminar. In these center workshops there will be more emphasis on practical problem-solving through the use of gender analysis.

Finally, a symposium will be held late this year at KARI headquarters, to which socio-economists from national and regional research centers will bring case studies from their own experience for presentation to the wider group. These case studies will offer concrete examples of how knowledge of gender issues in agriculture and livestock raising has increased the success of KARI endeavors. This will involve combing KARI experience for specific instances of gender-sensitive activities. ODA project funds were proposed for this symposium.

In addition to this series of workshops, the Gender Task Force proposed to launch a Socio-economics Division newsletter and to develop a position paper on gender issues and analysis for circulation throughout KARI. The need for closer communication between regional and national centers and between these and KARI headquarters was recognized. This is particularly true for the small groups of socio-economists and other staff potentially involved with gender issues, such as the food technologists, statisticians (gender-disaggregated data), and the KARI liaison officials linked to the provincial and division RELO's (research - extension liaison officers) of the agricultural extension service. Finally, a manpower study on

women in leadership roles and their promotion record and potential has been proposed.

Inclusion of Gender in Socio-economic Field Activities

Conversations with the socio-economists at Katumani, Thika, Embu, Kakamega, and Mtwapa revealed a high level of gender awareness. This was almost entirely focused on their field studies and consultations with farmers, and it specifically involved their felt need to involve women farmers in diagnostic and characterization studies, in participation in the use of on-farm trials of new technologies, and in adoption and impact studies.

Key gender issues were reported to be:

- high involvement of women in the decision to adopt new maize, sorghum, goat, and horticultural varieties disseminated by KARI.
- key role of women in deciding on food properties and desirability of new food varieties, especially important in the case of sorghum.
- women's labor time and overall work load in the acceptance of new technologies.
- women's access to and control over farm resources, particularly land, livestock, financial capital, and labor.
- women's control over the income from their activities, such as food crop sales and goat milk and offspring.
- women's mobility and access to information, including exposure to the benefits of new KARI technologies.
- women's exposure and interaction with extension service personnel or with the multi-disciplinary farming systems teams created by memoranda of understanding between KARI and local extension offices.
- interaction between women extension officers and women farmers to maximize communication.
- participation of women in cluster meetings and as respondents in informal or formal surveys.
- linkage of KARI and extension services with the increasingly numerous women's groups in rural areas.

Farm-level Contact

Some of the most important work undertaken by the socio-economists is in the context of farm-level diagnostic surveys, in which they are teamed with research scientists from their station and local extension agents. The extension service coordinates activities with the KARI regional research center through its RELO, or research - extension liaison officer. One of the socio-economists on station is normally named as liaison coordinator for KARI.

The activities these teams engage in jointly include: field visits to individual farms; field days, in which farmers assemble to meet with the team; on-farm trials supervision and results monitoring; special surveys, and planning meetings.

One of the better means of reaching women farmers constantly mentioned by socio-economists and extension agents is interaction with women's self-help groups, of which there were 23,614 in 1991, with a membership of 968,941 (Odongo, 11, 1993). These groups have a variety of names in local languages, but appear to be an outgrowth of traditional women's associations. One of the common forms of these groups is the rotating savings and credit association, or "merry-go-round group", in which a number of women contribute each month to a common pot, which is withdrawn by each member in turn.

Women's groups may be specialized or polyvalent and normally begin as social development groups. They are usually registered with the Ministry of Culture and Social Services. Farming and livestock production are the major activities, including cash crop production, fish, sheep, goat, and pig raising, beekeeping, and poultry farming (Odongo, 11, 1993).

These groups are an ideal means to approach women who have joined together to share agricultural tasks, such as the terracing work they jointly undertake in Machakos, where the groups are known as "mwedhia" and are clan-based. About two-thirds (68%) of women's groups throughout the country are visited by some type of extension officer (Odongo, 11, 1993).

Men may sometimes belong to women's groups but cannot normally be officers. About 11% of membership overall is male (Odongo, 11, 1993). Groups may contain from 10 to 50 or more women and are an excellent entry point for NGO's, home economics and agricultural officers of the extension service, or the joint research-extension teams in which KARI staff now participate actively.

In meetings with farmers, called "baraza", KARI socio-economists report increasing attendance by women, even in the more conservative coastal zone around Mombasa. Women are asking pointed questions and are clearly more at ease with mixed groups of men and women farmers than previously. Nevertheless, women are still most accessible in their own groups and when contacted by female extension agents.

At the farm level, socio-economists claim they talk to the person responsible for cultivating the crop of interest, which is generally women, although they cannot, of course, ignore the man if he is present. The fact that throughout Kenya men hold title to the land, are

considered owners of farm buildings, machinery, and livestock, and are nominally head of family, means that visiting research - extension teams may sometimes be required to discuss farm issues with women only when men are present. This is especially the case in the coastal zone, but the situation is apparently changing to allow women more direct access to extension services throughout Kenya. It would be highly desirable to recruit and deploy more female agricultural extension agents, who are at present only about 25% of graduates from agricultural schools and colleges but are rarely front-line extension agents (Odongo, 11-12, 1993). On the other hand, the Agriculture and Home Economics officers are predominantly women.

Studies and Surveys

While research center socio-economists are conversant with gender issues, it remains to be seen how well such issues are integrated into their work in the future. A number of socio-economic research proposals had been submitted last year for funding and were either on-going or not yet approved at KARI headquarters. The proposals seen were of good quality, but presented in logframe format, which did not appear to focus sufficiently on gender issues. Sex-disaggregation of data would be desirable in future, if gender analysis is to be seriously undertaken.

Although most of the first wave of characterization, adoption, and impact studies by the socio-economists is still on-going, a gender analysis of the maize data base work undertaken in 1993 has been made by KARI socio-economists R. Hassan (KARI/Nairobi) and Beatrice Salasya, socio-economist at Kakamega RRC (Hassan and Salasya, 1993). This essay illustrates the type of gender-related analysis the socio-economists should be routinely producing in the future, if they take care to sex-disaggregate the data collected.

Some of the findings in the maize study bear reporting here, because of the clarity of the findings and their importance to KARI research endeavors on maize varieties and dissemination.

The major findings were:

- Decisions related to the procurement and application of modern inputs on the maize shamba are mainly made by women.

- Maize technologies that fail to account for the special needs of female farmers will miss a considerable potential for increased productivity.

- Female and male farmers should be distinguished as two separate target groups in terms of specific technology needs.

- Across all ethnic and religious groups, female farmers were found to cultivate smaller holdings than male farmers (males had 3.6 ha. and females 7 ha. on average).

- Inequality between male and female farmers in access to land, education, and other services was unaffected by tribal and religious affiliations.

- Gender is a very important variable in terms of farmers' access to farm resources and agricultural services.

- Significantly more male farmers were reached by extension and credit services than women.

- Access to resources, education, credit, and extension services has important implications for farmers' ability to adopt new technologies and acquire external production inputs.

- A yield gap exists between male and female farmers, with men achieving higher yields on average (from 20% to 31% higher per hectare). This gap is directly related to male and female farmers' differential access to services and resources, including education, training, credit, extension services, size and quality of landholding, and machinery and equipment possessed.

- Female farmers were found to be more prepared to accept and take up new technologies than men, but they needed greater access to farm resources and agricultural technologies to increase their productivity.

- The T & V (training and visit) extension methodology contained a bias toward male farmers, requiring targeting of female farmers by extension agents to reduce this bias.

- In spite of extension bias, improved maize seed and fertilizer technologies have been adopted at similar rates by male and female farmers.

- Men did more selling of food produce than women, except in female-headed households.

- Most of the post-harvest activities (processing) are done by women, making them the most important factor in designing post-harvest technologies.

- Women's varietal preferences were similar to those of men. In more marginal environments women have a pronounced preference for local varieties.

VI. Conclusions

Gender Within the Institution of KARI

While KARI appears to hire new research scientists about equal to their proportion of the supply of degree-holding agricultural scientists, this still results in a relatively low-level of

women researchers. Since the future of KARI research will be to link largely women's agricultural needs to research priorities, it seems altogether appropriate to find ways to increase the number of women scientists within the institute.

The minority staff position of women at all levels of KARI may be more revealing of gender bias in the institution than the reduced level of female researchers, given the difficulties women face in achieving a scientific education in the face of strong social pressures in Kenyan society to avoid science, engineering, and technical education in favor of more traditional fields for women.

The virtual absence of women from top-level decision making posts at KARI headquarters and in the research centers, with the exception of four assistant directors at headquarters, should be recognized and addressed by KARI leadership as a significant internal gender issue. Given the fairly constant proportion of about 1 woman to every 5 employees at all key levels in KARI (overall staff, research officers, administrative staff, top-level public service grades), it would be reasonable to expect about the same proportion among top KARI managers. Such is far from the case.

Part of the reason women may not advance as rapidly as men lies in the reduced availability of long-term training options. Women among the USAID MIAC training participants were about half as numerous as their proportion among potential BSc.-holding candidates. This implies that they were about half as likely to be sent for long-term training as their male colleagues. It is recognized that many of the reasons women do not go for overseas training have to do with traditional Kenyan gender roles over which KARI has little control.

Gender Within the Socio-economic Work of KARI

While it is clear that much more attention to gender issues and analysis is required by KARI staff in the future, it appears that the institute has truly embraced the need for establishing closer linkages between research priorities and products and farmer needs and that management and technical personnel appreciate the need to include appropriate numbers of women farmers and consumers in these linkage activities.

The push to build the number and capacity of the socio-economists in order to do farming systems research and extension correctly and efficiently seems undeniable. USAID/Kenya can take a large portion of credit for this accomplishment, including the requirement at the beginning of NARP II for KARI to create a socio-economics unit within 6 months of start-up. The MIAC contract is also funding the critically important activities of the head of the Socio-economic Division.

The 59 socio-economists (including expatriates) scattered among the 28 research centers and KARI headquarters are functioning as intended, although they are certainly insufficient to accomplish all that will be required of them in future. Moreover, only 21 of these socio-economists have post graduate-level training, a situation that must be corrected for them to function on an equal level with the bio-physical scientists.

Under the World Bank umbrella NARP II program, the future of the farming systems methodology and of the socio-economists appears to be destined for continued strengthening. The provision for at least 34 graduate-degree personnel in all centers and in KARI headquarters and continued donor funding for socio-economic work should translate into increased number and sophistication of socio-economic applied research products.

Gender awareness and analysis have been made an integral part of the functioning of the socio-economic units in headquarters and in the centers. This will be crucial to the success of the research - extension linkages already established through memoranda of understanding between KARI field centers and local extension administrations.

Future farm characterization and crop studies, on-farm trials, adoption studies, yield calculations, and income impact surveys are intended to include women respondents in their sampling, at least in proportion to their importance in the local farming system.

Special studies of women's important roles in various cropping systems, such as the maize study already analyzed by KARI socio-economists, should continue to underscore the importance of consulting women farmers, of treating men and women farmers as two distinct target groups, and of collecting sex-disaggregated data in all studies.

Gender training is highly advisable for all of KARI management and research scientists and will be undertaken over the next year by the Socio-economic Division assisted by various donor projects (Dutch, ODA, USAID). The first step will be a half-day workshop for key headquarters managers, followed by the same in as many field stations as feasible. Eventually, a large symposium will group the socio-economists and focus on case materials brought in from the field experience of KARI practitioners.

The existing tendency for anything outside of bio-physical research to be dropped into the hands of the socio-economists will require change, because attention to farmer needs, farming behavior, and gender-differentiated constraints and strategies will need to be understood by all scientists and managers, if KARI is to remain relevant to Kenyan farmers.

VII. Recommendations

1. KARI should actively seek to promote qualified women to a larger number of senior management positions, particularly in the national and regional research centers. At present none of these has a confirmed female director or deputy director. At a minimum the proportion of female managers should be equal to the percentage of women among research scientists (22%). USAID may wish to monitor this situation during the remainder of NARP II.

2. If KARI wishes to take action to increase the number of women among its trained scientists and eventually among key managers, it should envisage innovative means to increase the number of female long-term trainees, selected about half as frequently in proportion to their number as male scientists during NARP I and II. "Split programs" with more frequent return of candidates for research in Kenya may be able to address women's

need to balance domestic and career aspirations. USAID should be aware of women's special needs in this regard and monitor this situation in any future phase of NARP funding.

2. KARI should be prepared to appoint 5 senior socio-economists to KARI headquarters to complement the 1 already in place alongside the 4 contractors who will eventually depart. Their role will be crucial in guiding and coordinating center activities and in synthesizing data from the 28 centers to inform priority setting at the program level. An equal number of men and women in this core group of 6 senior socio-economists, including some trained in economic anthropology, would be desirable.

3. The two research streams within KARI--commodity/factor research in national research centers and adaptive research in regional centers--may require more than one socio-economist at the post-graduate degree level in the national and regional centers. Two persons at this level would be highly preferable, and even these may not be sufficient to cover all tasks required of this group. In future hiring of socio-economists, an attempt should be made to hire equal numbers of women and men and to broaden the mix of disciplines to include rural sociology and economic anthropology.

4. KARI should focus its socio-economic staff on key research stations, particularly the regional research centers where adaptive research and socio-economic input are especially crucial to dissemination of appropriate agricultural technologies. The time-consuming diagnostic surveys and farm-level contacts and the large number of studies to be undertaken by this group means that priority may need to be given to certain stations. A critical number of good socio-economic researchers needs to be maintained if the farming systems approach is to become an effective model for KARI in future.

5. Basic gender awareness and analysis training should be given to as many KARI senior managers and researchers as possible, both at headquarters and in the research centers. The work of the Gender Issues Task Force should be encouraged in this regard by KARI management. USAID should consider contributing to the funding of the series of training workshops planned by the task force for KARI.

6. Future farm characterization and crop studies, on-farm trials, adoption studies, yield calculations, and income impact surveys should disaggregate their data by sex, in order to compare men's and women's activities on-farm and in the adoption of new agricultural technologies. Women farmers should be sampled in proportion to their importance in the local farming system and their responses compared to men's.

7. Special studies of women's important roles in various cropping systems, such as the maize study already analyzed by KARI socio-economists, must continue to underscore the importance of consulting women farmers, of treating men and women farmers as two distinct target groups, and of collecting sex-disaggregated data in all studies. From time to time specific research products should be devoted to women's agricultural constraints, such as land ownership and access to credit.

8. Bio-physical scientists should be increasingly exposed to farmer needs and behaviors, in

order to broaden the contact between crop research and farmer client. Contacts with farmers must not be left only to the socio-economists.

9. Women's groups should be used whenever possible as part of the farming systems methodology. When mixed groups of farmers assemble to discuss with multi-disciplinary teams, an appropriate number of women farmers should be present. Given the role of women in Kenyan agriculture, this may well mean a majority of women in attendance.

10. KARI should encourage the use of women researchers and extension agents in its multi-disciplinary contacts with farmers, a majority of which are clearly women. It should actively recruit women into its ranks at all levels and encourage the agricultural extension service to recruit female extension agents for use in farming systems work. The very success of this methodology may well depend on messages passing between women to a degree never previously imagined.

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4.	Kamau, Mercy	Socio-economist. Thika NARC.
5.	Kooijman, Margo	Technical Cooperation Scientist. Royal Tropical Institute (Netherlands). Katumani NARC.
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8.	Madumadu, Glynn	Program Coordinator, Horticulture. Thika NARC.
9.	Materi, Francis	Chief, Socio-economics Unit. Embu RRC.
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14.	Ndele, Stephen	Monitoring and Evaluation and WID Officer. USAID/Nairobi.
15.	McLeod, Anni	Livestock Specialist. KARI/ODA Socio-economics and Epidemiology Project. KARI HQS. Nairobi.
16.	Ndongo, Felicia	Research Extension Liaison Officer (RELO) for Western Province to Kakamega RRC.
17.	Ndubi, Jessica	Socio-economist. Embu RRC.

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23. Otieno, Leonard	Chief, Socio-economist Group. Mtwapa RRC.
24. Rono, Selly	Horticulturalist. Kitale NARC.
25. Salasya, Beatrice	Chief of Socio-economic Unit. Kakamega RRC.
26. Wanjekeche, Elizabeth	Food Technologist. Kitale NARC.