CGIAR GENDER PROGRAM

WORKING PAPER, NO. 8

INVENTORY OF GENDER-RELATED RESEARCH AND TRAINING IN THE INTERNATIONAL AGRICULTURAL RESEARCH CENTERS 1990 - 1995

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ABBREVIATIONS AND ACRONYMS

ACIAR	Australian Council for International Agricultural Research
AFNETA	Alley Farming Network for Africa
AFRENA	Agroforestry Research Networks for Africa
ASFRE	Association for Farming Systems Research and Extension
CBC	Crossbred cows
CGIAR	Consultative Group on International Agricultural Research
CIAT	Centro Internacional de Agricultural Tropical (Colombia)*
CIDA	Canadian International Development Agency
CIFOR	Center for International Forestry Research*
CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo*
CIP	Centro Internacional de la Papa*
CIRES	University of Abidjan in Côte d'Ivoire
COSCA	Collaborative Study of Cassava in Africa
CRSP	Collaborative Research Support Project
ENI	Ethiopian Nutrition Institute
ESAMI	East and Southern Africa Management Institute
FAO	Food and Agricultural Organization of the United Nations
FMIS	Farmer Managed Irrigation Systems
IAR	Institute of Agricultural Research (Ethiopia)
IARC	International Agricultural Research Center
ICARDA	International Center for Agricultural Research in the Dry Areas*
ICLARM	International Center for Living Aquatic Resources Management*
ICRAF	International Centre for Research in Agroforestry*
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics*
IDRC	International Development Research Centre (Canada)
IFPRI	International Food Policy Research Institute*
IIMI	International Irrigation Management Institute*
IIRR	International Institute for Rural Reconstruction
IITA	International Institute of Tropical Agriculture*
ILRI	International Livestock Research Institute*
IPGRI	International Plant Genetic Resources Institute*
IPM	Integrated Pest Management
IRRI	International Rice Research Institute*
ISNAR	International Service for National Agricultural Research*
IUCN	World Conservation Union (formerly International Union for the Conservation of Nature and Natural Resources)
LBC	Local cattle
MPT	Multi-Purpose Tree
NDDP	National Dairy Development Project (Kenya)
NGO	Non-Government Organization

PCARRD	Philippines Council on Agricultural Research and Rural Development
SADC	Southern African Development Committee
SIDA	Swedish International Development Authority
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
USAID	United States Agency for International Development
WANA	West Asia North Africa
WARDA	West Africa Rice Development Association*

*Centers of the CGIAR

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The use of gender analysis or a gender perspective in agricultural research takes many forms and within Centers, scientists are not always knowledgeable about the specifics of their colleagues' research. In order to compile this inventory, cooperation and assistance was needed from every Center and many scientists. I am grateful to them all for taking the time to find materials or write descriptions of current work. I am also grateful to John Curry, a consultant to the CGIAR Gender Program, who carried out an extensive review of IITA's portfolio and provided many observations of research practice. I am particularly grateful to the Directors of Research and the Gender Research Contact Persons for reviewing the work of their Centers during the March survey. I would also like to thank Mike Collinson, Science Advisor to the CGIAR Secretariat, for his continuing support in the efforts to document Center activity.

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While every effort was made to insure the accuracy of this document, I remain solely responsible for its final form.

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Hilary Sims Feldstein
October 1995

INVENTORY OF GENDER-RELATED RESEARCH AND TRAINING IN THE INTERNATIONAL AGRICULTURAL RESEARCH CENTERS, 1990 - 1995

Introduction

Since 1991, the CGIAR Gender Program for Gender Analysis has sought to

> *Strengthen the use of gender analysis in research aimed at technology development and in training for developing country researchers to ensure that women's, as well as men's, agricultural enterprises and operations are fully considered when defining research problems and setting priorities.*

One objective of the Program for Gender Analysis has been to learn about the recent and current research and training by the IARCs which does incorporate gender analysis or a gender perspective. Our search has resulted in this list of 140 projects. There is no baseline from 1989 with which to compare current activities, but the fact that there are 140 such projects indicates a growing use of gender analysis and explicit attention to women as well as men farmers and users of technologies.

The purpose of this inventory is to locate where and what kind of gender-related research, training and dissemination activities are going on in the System. This provides a baseline for 1995. It also helps us to see some patterns, discussed below. It provides a rich array of examples of the different ways and in the different areas, gender-related agricultural research takes place. The leadership the Centers are beginning to take in methodology development and incorporation of gender in particular projects will receive more visibility. This will be valuable to all those who are looking for models. An earlier version of the compilation was sent out on the E-mail and prompted further requests. We hope also that the publication of this inventory will enhance the information flow for future compilations.

Methodology

Since 1991, we have been collecting accounts of gender-related research and training from individual scientists. Learning about what research and training is actually going on in a center is not easy. The scientists concerned usually have to be identified and contacted. They are not always visible. Over the past three years we have made many such contacts, but as is described below the amounts of information about particular research and training efforts vary as to the level of detail presented and to whether it is a "project" *per se* or a series of observations connected with a research program which indicate a gender awareness brought into their work. We have recorded both.

Visits to some centers provided opportunities to learn more about current research and training activities and to interact with the scientists. This allowed more detailed knowledge of the research being done. Many scientists also sent papers which gave a fuller sense of the research and its outcomes. However, some research which incorporates a gender perspective is just beginning and as yet has little to report. Such efforts have been recorded with very short descriptions. There is also unevenness with respect to the level of research described. For instance, the Division Director of IITA's Crop Improvement Division stated that all the crop improvement activities incorporate quality considerations and post harvest concerns. This has one entry. Contrariwise, the Cassava Program of CIAT listed five discrete projects and has five entries. Some characterization or impact assessment projects which regularly elicit 'who does what' may never have made it to the list, because the practice is so routine and therefore not brought to our attention. The variety of levels included here (confounded by the different ways in which Centers categorize their research activities) makes strict comparability very difficult.

A preliminary list of gender-related research and training projects was completed in January 1995 and sent to all Directors-General, Directors of Research, and the Gender Analysis focal points at each center along with a separate list of the research and training listed for that center. It was also sent to scientists we had identified as engaged in such research. This was accompanied by a request to the Gender focal point to provide information on additional research and training incorporating a gender perspective and to make corrections to the original list. Every center responded and the list has nearly doubled. However, these responses were also uneven with respect to the detail reported.

This inventory then is a mixture of Center self-reported research and training and summaries of research and training papers available to the editor. With given resources, it was not practical to do more digging for detail. We chose on the side of inclusion even where there is little detail. The present collection is fairly complete and certainly representative of the current state of gender-related research, training, and information dissemination in the CGIAR.

What is included.

Included in this compilation any research which incorporates gender analysis. By that we mean, the research is concerned with the users (as actual or potential adopters) and care is taken to differentiate among users by gender, age, as well as any other useful variables such as resource holdings or ethnicity. Some projects, having taken that first step, focus on one sex or the other as the most appropriate informant or collaborator. For instance, in Dr. Louise Sperling's CIAT research, the local bean experts are women; in the participatory breeding research on pearl millet being conducted by Dr. Eva Weitzen Rattunde and Dr. Meri Whitaker at ICRISAT, men are the predominant producers in some villages, women in others.

A number of projects focus on women's knowledge, women's labor or women's technologies. There are several reasons for this.

(1) The usual research project undertaken by IARCs does not state 'who is the farmer?' or the user. Rarely do they identify the farmers or other users important to a commodity and state the empirical basis for that identification. Research projects which *do* ask 'who is the farmer?' also usually state who is the appropriate collaborator for particular commodities or operations. One result of using gender analysis is the identification of women-specific operations or commodities and these then are made evident in the research protocol or description. Using gender analysis makes women more visible and this is usually noted whereas men's visibility is usually taken for granted.

(2) Some Centers have proactively sought to identify women-specific commodities or operations which could be improved with new technologies. Dr. Graeme Quick and Thelma Paris at IRRI and Dr. Jeon and Leonie Halos-Kim at IITA have worked on postharvest machineries for rice and cassava, respectively. Concern with nutrition makes women, who provide food for household members, the most important collaborators. Dr. Low of CIP is working with women's groups in Kenya to increase the availability of Vitamin A through the production of sweet potatoes and development of weaning foods. In a similar manner, Dr. Osho at IITA has been in the forefront of spreading the use and the production of soybeans because of their protein content. These scientists and Centers have realized that investing in women's productivity or otherwise addressing their agriculturally-related needs can have a rapid and positive impact on livelihoods and welfare. Asking 'who does what' is the first step in identifying such projects.

(3) Included also are some women-specific studies undertaken by Centers which recognized they knew little about the patterns of women's involvement in agriculture in the region or in a particular sector such as irrigation. For example, an extensive review of the literature on women and agriculture in the West Asia North Africa region brings together for the first time a range of anthropological and fugitive literature to lay a groundwork for understanding women's roles in crop and livestock production.

Organization

The entries are arranged according to the CGIAR's current categories for research:

(1) Germplasm enhancement and breeding,
(2) Crops and cropping systems,
(3) Livestock and livestock systems,
(4) Trees and tree systems,
(5) Fish and Aquatic Systems,
(6) Protecting the environment,
(7) Saving biodiversity,
(8) Improving policy,

(9) Training
(10) Documentation, publications and information dissemination,
(11) Organization and management counseling, and
(12) Networks.

To this we have added an additional category in order to keep track of these initiatives.

(13) Priority setting and project proposal and review

Within each category the entries are listed by center alphabetically. The entries are numbered sequentially from 1 to 140 throughout the document.

The CGIAR categories of activities tell something about the system in which the research is being conducted, but not the nature of the research, such as characterization or impact assessment. We therefore created a second set of cross-cutting categories and indicated which entries fall into these categories. Some entries fall into more than one category. The numbers for entries in each of these categories is given in Annex A. Annex B provides two matrices showing center representation according to the CGIAR categories and the Cross-cutting categories.

(A) Methodologies development
(B) Adoption studies and impact assessment
(C) Characterization and diagnostic studies
(D) On-farm evaluation
(E) Postharvest processing and management and marketing studies
(F) Literature reviews and special studies
(G) Women-specific technologies or women-focused studies.

Annex C is an index by the names of research scientists. Annex D provides the addresses of all the centers so that the reader can write for further information.

Discussion

While the discussion here is based on the research and training listed in the inventory, the reader should remember there are problems with the strict comparability between the entries. It is best to look at this as indicators of magnitude rather than absolute measurements.

Reviewing this research reveals a number of things. First, all centers are doing something. CIAT and IFPRI have the most entries followed closely by IITA. CIAT has had a long history of gender-related research and had the benefit of a number of innovative mostly female anthropologists who have brought this perspective into their work. IFPRI's Food, Consumption and Nutrition Division used intrahousehold analysis in its studies of the effects of commercialization of agriculture and discovered strong

evidence that *who* gets an income makes a difference in terms of nutritional outcomes. This has led to the proposition that intrahousehold or gender analysis does make a difference and they are devoting considerable resources to exploring this methodologically.

Second, scientists are using gender analysis in a clear and scientific attempt to understand who is most knowledgeable, who are the stakeholders, or who will be (or is) affected by new technologies associated with a particular commodity or environment. The projects described here provide excellent and practical examples of how gender analysis can be usefully incorporated in international agricultural research.

Third, of the CGIAR categories, a large proportion is done in Crops and Cropping Systems (41 entries), followed by Improving Policies (23 entries). Germplasm Enhancement includes 14 entries, in part because of the recent experimentation with participatory breeding. Trees and Tree Systems has 13 entries. Fish and Aquatic Systems is at the bottom, not surprising given the size of ICLARM. What is surprising is how few entries seemed to fall into the category of Protecting the Environment, though this could be a matter of interpretation. Some of the items under the combined production systems might be construed to be protecting the environment.

Fourth, of the cross-cutting categories, much of the work falls into the area of characterization and diagnosis (38 entries), women-specific technologies or studies (23 entries) or impact assessment and adoption studies. (16 entries).

Fifth, social scientists and female researchers engage in this research and training in a much higher proportion than their proportion in the system as a whole. Table 1 reports by each category of research, the number of technical and social scientists and male and female researchers engaged in gender-related research and training and provides the percentage of social scientists and females for each category. Not unexpectedly, social scientists predominate in all categories except Trees and Tree Systems and Protecting the Environment where social scientists are 50%. Female researchers predominate only in Documentation, Publications and Information (60%), Germplasm Enhancement and Breeding (59%), Improving Policy (59%), and Crops and Cropping Systems (51%).

Table 2 shows the distribution of technical and social scientists, male and female researchers by Center. Here the pattern of predominance by social scientists remains the same, except at IITA. For gender related research, female researchers predominate at IIMI (100%, with one gender specialist, an outlier), ISNAR (80%), ICRISAT (80%), CIAT (70%), IFPRI (60%), and CIP (55%).

Table 1. Number of technical and social scientists and male and female researchers doing gender-related research and training according to the categories of research.

CGIAR CATEGORIES OF RESEARCH ACTIVITIES	TOTAL SCIENTISTS	TECHNICAL SCIENTISTS	SOCIAL SCIENTISTS	MALE	FEMALE	PERCENT SOCIAL SCIENTISTS	PERCENT FEMALE
. Germplasm Enhancement & Breeding	14	6	8	6	8	57%	57%
. Crops & Cropping Systems	37	18	19	18	19	51%	51%
. Livestock and Livestock Systems	8	3	5	7	1	63%	13%
. Trees and Tree Systems	14	7	7	9	5	50%	36%
. Fish and Aquatic Systems	1	0	1	1	0	100%	0%
. Protecting the Environment	4	2	2	3	1	50%	25%
. Saving Biodiversity	8	3	5	7	1	63%	13%
. Improving Policy	17	3	14	7	10	82%	59%
. Training	9	1	8	7	2	89%	22%
0. Doc./Public./Info Dissemination	5	2	3	2	3	60%	60%
1. Organization/Mgmt Counselling	5	2	3	1	4	60%	80%
2. Networks	2	2	0	2	0	0%	0%
TOTAL	124	49	75	70	54	60%	44%

Table 2. Number of technical and social scientists and male and female researchers doing gender-related research and training according to their Center.

	TOTAL SCIENTISTS	TECHNICAL SCIENTISTS	SOCIAL SCIENTISTS	MALE	FEMALE	PERCENT SOCIAL SCIENTISTS	PERCENT FEMALE SCIENTISTS
CIAT	10	3	7	3	7	70%	70%
CIFOR	7	3	4	4	3	57%	43%
CIMMYT	7	2	5	5	2	71%	29%
CIP	11	4	7	5	6	64%	55%
CARDA	12	5	7	9	3	58%	25%
CLARM	2	1	1	2	0	50%	0%
CRAF	12	5	7	10	2	58%	17%
CRISAT	5	1	4	1	4	80%	80%
FPRI	15	3	12	6	9	80%	60%
IMI	1	1	0	0	1	0%	100%
ITA	15	12	3	9	6	20%	40%
LRI	6	2	4	6	0	67%	0%
PGRI	4	2	2	3	1	50%	25%
RRI	7	3	4	3	4	57%	57%
SNAR	5	2	3	1	4	60%	80%
VARDA	5	0	5	3	2	100%	40%
TOTALS	124	49	75	70	54	60%	44%

What these two tables tell us is that men as well as women do gender analysis. In numbers alone, men predominate. But when compared to the percentages of males and females in the IARCs, the story is different. Fifteen percent of the IARCs' scientists are female; of the scientists doing gender-related research, 44% are female. This indicates that there may be a greater propensity for women to do gender-related research and training or the fact that they are women may make such research and training easier to do. Likewise, much of the research and training is being done by social scientists (60%) though of internationally recruited staff they make up 15% of staff. The inclusion of IFPRI does not seriously affect the numbers. The predominance of social scientists corresponds to the emphasis on characterization and impact work.

To be effective in agricultural research and training requires being open to the knowledge and views of the actual users. In turn such work benefits from collaboration and interdisciplinary research. Thirteen projects listed are led jointly by both social and technical scientists and a number of others are being done by teams but the scientists are not identified..

Sixth, two Centers, ICRISAT and IRRI, are incorporating a gender dimension in their priority setting. The use of gender proxies for priority setting makes gender more visible, but it does not address the specifics of how research and training is done. CIP and ICRISAT now include a question concerning the gender implications of research and training in their project proposal or reporting forms. This is intended to make scientists more reflective about just who is the user and how he and/or she will be affected by the work at hand. These attempts are too new to evaluate as yet, but are included in the inventory as revealing of the instruments being used by some Centers to encourage a gender perspective.

This inventory represents both a baseline and a strong beginning for the IARCs in using gender analysis in their research, training and dissemination activities. They range from the proactive, such as the work by Dr. Ezyaguirre's work on green leafy vegetables, to the "experimental" such as Dr. Smale's investigations as to whether gender makes a difference in the selection and conservation of maize seed. It provides a rich sample of the kind of research which can be undertaken within the context of international agricultural research.

INVENTORY OF GENDER-RELATED RESEARCH

1. Germplasm Enhancement and Breeding

CIAT Dr. Louise Sperling [left CIAT 6/93]

1. Anthropologist. In collaboration with the Institut des Sciences Agronomiques du Rwanda (ISAR), Dr. Sperling conducted a pilot study bringing women bean experts on station to evaluate 15 varieties of beans. This is at a stage earlier than the usual on-farm testing of 2-5 more finished varieties. In discussions with station agronomists, the women bean experts cited a number of attributes other than yield that they found attractive in the experimental varieties they viewed. Women were invited to take two or three varieties home and plant them according to their own experimental methods and including a local check. A comparison of the yields of their choices with those of the breeder's choices demonstrated better performance. That is, a greater percentage of their choices out performed the local check and by higher yields than did the breeders. This extremely interesting and path breaking research has been published as a CGIAR Gender Program Case Study. (L. Sperling and P. Berkowitz. 1994. Partners for Selection: Bean Breeders and Women Bean Experts in Rwanda. CGIAR. Copies are available by writing to Hilary Sims Feldstein or Mike Collinson c/o the CGIAR Secretariat; and L. Sperling, M.E. Loevinsohn and B. Ntabomvura. 1993. Rethinking the farmer's role in plant breeding: local bean experts and on-station selection in Rwanda. Experimental Agriculture 29:509-519).

CIAT Dr. Ann Marie Thro

2. Biotechnologist. The Cassava Biotechnology Network (CBN) carries out research to determine desirable research priorities for cassava by learning about the needs and preferences across the continuum from producers through marketers, processors, and consumers. In October 1993, they completed their first study outside of Latin America, a study done in the Lake Zone of northern Tanzania which is a cassava-dependent subsistence farming area. The study used Rapid Rural Appraisal methods, primarily group meetings at the village level, and interview matrices on cassava varieties and their characteristics. Special care was taken to include at least one woman on each team and this was subsequently judged to have contributed to more participation by women. Though men dominated village group meetings, women became involved as the questions shifted to processing and to the areas where women were at work. Information obtained included descriptions of a wide assortment of varieties grown to fit particular agronomic, processing, or timing niches. Men are responsible for most decisions related to cassava production and processing, but women do most of the labor except for land preparation and the production of beer.

The study had several implications for cassava research. The findings confirmed the direction of current research on cassava cyanogenesis, traditional and new village-based processing methods, and small scale commercial processing as well as resistance or tolerance to mealy bug and green mite. Research which would specifically benefit women includes the shape of cassava to ease harvesting. Research on improved processing and its relationship to cyanogenesis would effect women, but in ways which are difficult to anticipate. A particular role for biotechnology is in microbial biotechnologies to improve cassava fermentation and in using cassava tissue culture to speed up variety multiplication. Medium term and long term research possibilities were also identified. The report from which this is drawn is interesting for its clear presentation of how biotechnology can be linked to farmers' and users' needs as well as a straight forward exposition of the research process and funding. (Cassava Biotechnology Network (CBN). 1994. Village perspectives on cassava and implications for biotechnology research: a CBN Case Study in the Lake Zone of Northern Tanzania. CIAT.)

CIAT Nora Ruiz de Londono

3. Economist. Dr. Ruiz de Londono supervised a thesis based on a survey of housewives in Bolivia to obtain information on consumer attitudes to beans. This enabled the breeding program to take account of preferences with regard to color, texture and cooking quality. Prior to this the main focus had been on production characteristics (R.M.Vargas. 1992. Estudio de consumo y mercado de frijol en el departamento de Santa Cruz, Bolivia. Thesis for degree of Ingeniero Agronomo, Universidad Autonoma Gabriel Rene Moreno.)

CIAT Cassava Program

4. Gender specific data being collected in the diagnostic surveys on the impact of cassava production and processing technologies on the quality of life (differentially for women and men) is being studied in the north coast of Colombia.

CIMMYT Dr. Melinda Smale

5. Economist. A specific effort in Malawi over the past five years has been to examine household maize processing and storage, as well as farming practices. This information has contributed to the development, testing, and successful introduction of new maize hybrids that meet the requirements of small holders. An important element missing from earlier hybrid varieties was the "flintiness" characteristics of local varieties which made a more satisfactory basic flour for porridge. As a result of these findings, newly developed semi-flint varieties have been tested. Information from women, both as farmers and as consumers, has played a crucial role in this analysis, and the initial results regarding the acceptance of the new varieties are very impressive. (M. Smale, Z.H.W. Kaunda, H.L. Makina, M.M.M.K. Mkandawire. 1993. Farmers' Evaluation of Newly Released

Maize Cultivars in Malawi: A Comparison of Local Maize, Semi-Flint and Dent Hybrids. CIMMYT)

CIP Dr. Greta Watson [left CIP 12/93]

6. Human Ecologist. In the PROINPA project in Bolivia, the team undertook an experiment with farmer participatory techniques as well as four sets of clonal evaluations. In the second stage of testing the organizational form for choosing farmer collaborators was changed from representatives of a syndicate to selection of individuals in order to insure that women farmers were among the collaborators. Women were 7 of the 20 participating farmers. Men and women generally agreed on desirable consumption characteristics. In subsequent field days numbers of women increased indicating effective networks for spreading information.

ICARDA Dr. Salvatore Ceccarelli and Dr. Stefania Grando

7. Barley Breeders. Barley breeding activities in Syria and Ethiopia focus on landrace improvement and in corporate gender perspective through indigenous knowledge and farmer germplasm selection.

ICARDA Dr. Ali Abdul al-Moneim

8. Forage Legume Breeder. Breeding activities for forage legumes in Syria and Lebanon focus on the use of local germplasm and adaptation of wild types for improvement and incorporate gender perspective through indigenous knowledge in use of them by sheep.

ICARDA Dr. R. Tutwiler

9. Anthropologist. Gender disaggregated information routinely collected and analyzed in virtually all adoption and impact research. Studies used for feedback to other projects and for reporting to donors done in full partnership with NARS. Gender disaggregated information on consumer quality preferences in good legumes and constraints to adoption are fed back to the breeding program.

ICARDA Dr. Abelardo Rodriguez

10. Agricultural economist. Barley marketing study in conjunction with breeding program incorporates gender dimension.

ICRISAT Dr. Eva Weitzen Rattunde and Dr. Meri Whitaker

11. Pearl millet breeder and economist. In Rajasthan they have been working with four sites to learn what farmers want in improved pearl millet. Researchers are planting out ICRISAT varieties, not as an on-farm trial *per se*, but to have materials which farmers can evaluate with respect to specific technical requirements. Where women predominate as the growers and users of pearl millet, members of a local women's group are the primary collaborators. In a second village, there are equal numbers of men and women, and the data is to be analyzed

to see if there are differences in knowledge and preferences. The other two groups are all men are though women participants were specifically requested. One finding of the study has been the tremendous amount of technical knowledge and distinct preferences held by women with respect to pearl millet.

IITA Dr. Margaret Quin

12. Maize breeder and Director of Crop Improvement Division. Dr. Quin reports that the division gives considerable attention to the end-user and that a major element is the monitoring of quality as well as yield. Each crop improvement program (cassava, yam, Musa, maize, and soybean) considers postharvest characteristics and requirements and includes staff with specialization in postharvest. One example comes from the IITA portfolio review by Dr. John Curry. Dr.I.J Ekanayake in the Tubers and Roots Improvement Program (TRIP) works with Dr. M. Bokanga, TRIP biochemist, on evaluations of cassava processing and taste using women's groups as panels.

IITA Plantain and Banana Improvement Program.

13. During the IITA's portfolio review, scientists revealed two end user issues associated with their breeding work. One is that in many areas, people are not allowed to plant trees, including banana, on rented land. Second is the importance of end user preferences.

WARDA Dr. Akinwumi Adesina.

14. Economist. Studies to determine gender differences in technology adoption, rice germplasm collection, preferences, and utilization. In South-West Côte d'Ivoire, rice is predominantly a woman's crop and women are responsible for the collection and conservation of rice germplasm. The harvesting method practiced by the women in the region is single panicle harvesting. Although men favor short stature and high yielding varieties, women feel such varieties are too short for single panicle harvesting method. While it is possible for women to keep their children on their backs while harvesting the tall varieties, this is impossible for the short stature varieties. "Gender blindness" in inappropriately targeting short stature varieties (that need to be harvested by sickles) into such systems could lead to rejection of albeit "technically" appropriate rice varieties.

Women are responsible across West Africa for cooking rice. They have distinctly different preferences from those of men for characteristics such as aroma, ease of cooking, ease of threshing, and taste of the rice. Through collaborative research between the economist and rice breeders, work will in the future be oriented towards the development of GIS maps of regions where women are important in rice production systems in West Africa, and their varietal preferences. This information will be used to better target varietal technologies that meet the particular needs of women rice farmers. (A.A. Adesina. 1992. Economics of rice

production in West Africa: State-of- the-Arts Paper. See Chapter 4: "Women Rice Farmers in West Africa: Implications for "Gender Sensitive" Technology Development Strategies". West Africa Rice Development Association. 156 pages.)

Production Systems Development and Management

2. Crops and Cropping Systems

CIAT Dr. Susan Poats [left CIAT 3/94]

15. Anthropologist. Worked in Ecuador with a union of farmer associations engaged in cassava processing for commercial markets as well as other commercially oriented agricultural activities. Associations differ in membership--most predominantly male and a few predominantly or entirely female. After looking at markets for different cassava products and the different production processes, the women's cooperatives and the men's cooperatives chose to produce different products--cassava chips to be used for cassava flour by the men's cooperatives, traditional starch for human consumption by the St. Vicente women's cooperative. The choices reflect different constraints on time and different objectives. Women were interested in the more labor intensive higher priced product which could absorb higher labor costs in order to ensure work for all members; men with the higher volume, less time intensive cheaper product. Women have few other income opportunities and this processing plant has provided them with income and incentives to plant their own cassava to ensure supply and increase their earnings.

An impact study of the San Vicente women's cooperative showed that starch production for human consumption had increased four fold between 1987/88 and 1992/93. In 1992/93, earnings of women at San Vicente for cassava activities alone surpassed the average off farm earnings from all sources for women in the area. Eighty-nine percent of women used the extra income for purchasing food for the household. Four other cassava growers/processors associations have decided to borrow money to start starch processing, learning from the San Vicente experience, and making modifications to suit their circumstances. Technologies for handling the waste waters from starch processing are also being developed. The success of the San Vicente experience can be attributed to the high degree of participation by processors in the design and testing of processing equipment.

Recognition of the importance of feedback from processors into varietal improvement is now emerging. The report identified that a key impediment to the adoption of a new cassava variety was that it was too hard for traditional graters. The report, therefore, concludes that tests on processing quality, as well as the traditional evaluations for yield, dry matter content and cooking quality are

required before release. (S.V. Poats. 1994. Ecuador Integrated Cassava Research and Development Project. In Annual Report. CIAT Cassava Program. 1993. CIAT)

CIAT Dr. Susan Poats. [left CIAT 3/94]

16 Anthropologist. In 1993, Dr. Poats reviewed the role of women in cassava production and processing in Latin America, focusing on indigenous populations and small scale mestizo farmers. The results revealed the important role of women in cassava processing in both communities, and in cassava production in indigenous communities. The study also indicated that the role of women may be expanding as a result of male out migration from rural areas. This study enabled the cassava program to identify areas where feedback from women was important. It also alerted the program to the need to continuously monitor changes in the role of women (S. V. Poats. 1993. Women and cassava production and processing in Latin America, CIAT. CBN Newsletter Vol. 1, No. 2.).

CIAT Dr.Charles Wortmann and Dr. Soniia David

17. Agronomist and Socioeconomist. A proposal for methodology development for farmer participatory research in bean-based systems in East Africa has been submitted for a Rockefeller Fellow. The project will primarily focus on women farmers because female-managed systems predominate in these areas. The impact of gender-related issues on crop, soil, and pest management will be analyzed. (Farmer Participatory Research cropping systems in Eastern Africa. Request for Rockefeller Social Science Fellow).

CIAT Cassava Program

18 Gender specific data being collected in the diagnostic surveys on pest management problems and production constraints in North East Brazil.

CIAT Cassava Program

19 Gender specific data being collected in the diagnostic surveys on soil conservation in South East Asia

CIAT Cassava Program

20. Gender specific data being collected in the diagnostic surveys on characterization of cassava production and utilization in China

CIAT Cassava Program

21. Gender specific data being collected in the diagnostic surveys on tropical forages: In the project on forages for small holders the benefit to women and families will be part of the assessment.

CIMMYT Dr. Daniel Buckles and Dr. Mary Soule [left CIMMYT in 4/95]

22. Agronomist and Agricultural Economist. Dr. Buckles and Dr. Soule worked on green manures in Mexico. One project works with an NGO on farmer participatory extension in which farmer-extensionists are trained to teach and monitor farmer use of green manures. Women are explicitly included and are encouraged to produce green manures especially for hog production. Women's participation being monitored.

CIMMYT Dr. Larry Harrington

23. Economist. Diagnostic surveys of rice-wheat systems in South Asia including CIMMYT, IRRI, and the NARSs of Bangladesh, India, Nepal and Pakistan. User perspective being introduced through diagnostic surveys in all collaborative research sites, including some participatory diagnosis. "Women have collaborated as survey team members and have uncovered information on important interactions among fuel use, farm yard manure production and utilization, firewood and crop residue management and livestock management that will be essential for the design of farm- and community-level interventions to ameliorate long-term processes of soil fertility decline." However, various problems have resulted in these findings not being fully reflected in site-level research.

CIMMYT Dr. Roberto Soza

24. Agronomist. Ghana Grains Development Project, CIDA funded. This is an extensive on-farm research project testing new maize varieties and new cropping patterns as well as capacity building for Ghanaian research scientists and extension staff. Conscious efforts were made and specific steps taken to include women farmers in the evaluation of varieties. Rate of adoption similar for men and women but more work involved. Two rural sociologists, Joyce Haleegoah and Lin Buckland, are now looking more closely at division of rights and responsibilities in maize and cowpea production by gender.
The Ghana Grains Development Project in cooperation with IITA produced a number of training material where gender analysis is fully integrated:

-"Maize and Legumes Production Guide"
-"Safe Use of Pesticides"
-"Post Harvest Losses in Maize"
-"Increase your Maize Yields with Fertilizer"
-"Effective Weed Control in Maize and Cowpea Production"
-"The 12 Steps to a Good Maize Harvest"
-"10 Steps to a Good Cowpea Production"

CIMMYT Dr. Dan Buckles and Dr. Roberto Soza

25. Agronomists. Dr. Buckles and Dr. Soza and colleagues from the Crop Research Institute in Ghana investigated *Mucuna pruriens* and *Canavalia ensiformis* as

legumes with potential as green manures in Ghana. Their investigation included amounts currently cultivated, food uses and preparation, and historical production and use. For this aspect of their study most of their informants were old and/or married women who had responsibility for providing food to their families. (P. Osei-Bonsu, D. Buckles, F.R. Soza, and J. Y. Asibuo. 1995. Traditional Food Uses of Mucuna pruriens and Canavalia Ensiformis in Ghana. CIMMYT Internal Document. Mexico, D.F.: CIMMYT)

CIP Dr. Peter Ewell

26. Economist. Coordinator, CIP's East and Southern Africa program. Characterization of potato and sweetpotato production being undertaken in several East African countries includes gender disaggregated data on activities and preferences.

CIP Dr. V.S. Khatana and Dr. M.D. Upadhya

27. Economist and Physiologist. Data and information were collected from potato growing areas in two districts (which together accounts for 95% of the total potato production of the state) of Meghalaya and new area of Kheda district of Gujarat in India. It was not possible to involve the participation of women from farmers' house in most cases. The team did interview the women laborers where sorting was in progress. Meghalaya society differs from rest of the country. The society here is dominated by women who are the heads of the house and owners of property. It was difficult to directly enter into the area and conduct survey. Northeastern Hill University provided the team with local male and female students to act as local guides.

CIP Dr. Jan Low

28. Economist. A project has been introduced in Kenya that proposes to strengthen the linkages between the agricultural research community, community-based women's groups, and the public health sector through having scientists at the National Potato Research Centre at Tigoni collaborate directly with women's groups already working with the Kenya Energy and Environment Organizations. The major goal of this research is to determine whether Beta-Carotene-rich sweetpotato varieties can provide a year-round, sustainable source of vitamin A in the diet in agroecological zones with significant levels of vitamin A deficiency among under fives. This approach responds to the Government of Kenya/UNICEF call to initiate mobilization campaigns to demonstrate effective ways of preventing vitamin A deficiency. Population pressure is forcing ever larger numbers of Kenyans into drier transitional and semi-arid agroecological zones where subclinical Vitamin A deficiencies are likely to be high. Therefore, the major objectives of the research are:

(1) to increase the availability of Vitamin A in the diet through the introduction of Beta-Carotene-rich sweetpotato varieties in a transitional and/or semi-arid zones in Kenya;
(2) to sustain the selected sweetpotato varieties through identifying women's groups interested in maintaining communal and/or individual plots of vines (planting material) year-round (i.e. fencing plots to prevent livestock intrusion; watering plots when necessary) and training them in rapid planting material multiplication techniques;
(3) to educate communities on the role of Vitamin A in the diet for both children and adults through working directly with women's groups, mobilizing public health workers, and utilizing the mass media;
(4) to collaborate with women's groups in developing infant weaning foods utilizing sweetpotato and processing sweetpotato for long-term storage without significant loss of Vitamin A content;
(5) to identify and work with women's groups interested in making and selling other processed products from sweetpotato as possible income-generating activities. If women are able to gain significant amounts of income from producing sweetpotato products, they will be more likely to sustain any communal or individual efforts;
(6) to develop and test participatory appraisal methodologies appropriate to this research, establishing viable feedback mechanisms from communities to agricultural researchers and food scientists concerning varietal and product suitability;
(7) to disseminate knowledge about how to develop and market any promising new products in Kenya and the other sub-Saharan African countries with significant sweetpotato production.

CIP Dr. Jan Low

29. Economist. Two surveys on sweet potato were conducted in 1994. In October, Dr. Low and her assistant, Margaret Ngungiri, pre-tested survey instruments to look at the profitability of sweetpotato relative to other horticultural crops on the Kibirigwe irrigation scheme in the Central Kenyan Highlands and assess the magnitude of planting material distribution from the scheme to surrounding rainfed areas. Margaret Ngungiri completed the survey work in November 1994.

CIP Dr. Jan Low and Dr. Vital Hagenimana

30. Economist and Physiologist. Dr. Low and Dr. Hagenimana the Kawanda Post-Harvest Program in Uganda to design and implement a two-week study in November 1994 characterizing the market structure for fresh sweet potato in Kampala and assessing the potential demand for three processed products having sweet potato as an ingredient: chapati, bread, and mandazi (a doughnut-like snack). Results from these studies will be presented in the next annual report.

ICARDA Dr. Lamia El-Fattal [consultant to ICARDA]

31 Planner. Dr. El-Fattal undertook a special study on women and technological change in Tunisia: the case of new food legume technology. Scientists at ICARDA have developed a cold tolerant chickpea which can be grown under winter conditions in the West Asia North Africa (WANA) region. The economic feasibility is promising given likely high yields of winter sown chickpea over spring sown without a great reduction in price. However, a major constraint to growing winter-sown varieties is the high cost of wage labor and/or unavailability of family labor for timely weeding and harvesting. These are tasks performed predominantly by women whether hired or family labor. An ex ante study of adoption indicated that adoption is most likely with large farmers who can afford to hire extra labor, thus creating some employment opportunities for women who work as wage laborers in agriculture. Small farmers, unless they have a large amount of underutilized family labor, are less likely to adopt, or where they do adopt, the extra labor requirements will fall most strongly on women family members. Research indicated that this will be problematic for women, increasing their labor without increasing their role in spending decisions. Decisions by large farmers to adopt herbicides or mechanized harvesting will reduce employment for women laborers. (L.El-Fattal, 1992. Women and Technological Change in Tunisia: The Case of New Food Legume Technology. Aleppo, Syria:ICARDA)

ICARDA Dr. Thomas Nordblom

32 Economist. Gender disaggregated labor inputs used in economic modeling of crop rotations and agropastoral systems.

ICARDA Dr. K. Makkouk

33 Virologist. Future integrated pest management project will include gender aspect, particularly with respect to participatory research approach.

ICARDA Dr. J. Haidar

34 Socioeconomist. Implications of legume harvest mechanization for women's labor being explored.

ICRISAT Dr. Rama Devi Kolli.

35 Agricultural economist. In cooperation with the state dryland research institute, CRIDA, Kolli studied two villages in Maharashtra state with respect to the impact on men and women and gender roles of the introduction of an ICRISAT-improved technology for groundnuts. The technology includes improved varieties and a set of recommended cultivation practices. The two villages represent with-technology and without-technology situations. Research methods included a combination of several participatory rural appraisal techniques and a quantitative survey. On the basis of the initial analysis she is finding that the pattern of sex-specific operations remains the same.

Compared to the without-technology village, in the with-technology situation both men's and women's family and hired labor increase with respect to groundnut production. Some labor comes from shifting priorities, i.e. less labor on other crops, some come from increases in the overall labor portfolio. This is particularly so for female hired labor, providing substantial increased employment. Parallel with this appears to be some decline in women's control of resources and benefits. Information on the sexual division of labor will be used to identify collaborators on further improvements such as inclusion of women, who have the most contact with the plant when it is growing, in trying integrated pest management (IPM) alternatives.

IITA 36. Dr. Y. W. Jeon and Ing. Leonie Halos-Kim
Engineer, Head of Cassava Processing Unit and Associate Engineer. This engineering unit has designed and put into a number of experimental situations machinery which eases and speeds the processing of cassava for different cassava outputs. One question is the scale of operation required to make the equipment beneficial. In some cases, they are being used by men and women in extended families; in another they are being used by a women's cooperative where women's cassava is exchanged for an equivalent amount processed. Halos-Kim and Jeon have been collecting data on inputs, outputs, cash flow, etc. of cassava and other processing machineries which have been developed. Data is disaggregated data and a paper is being written. Several desirable criteria for cassava have emerged from their work. These criteria would make mechanization of different processes more cost efficient or practical. They include uniformity in size, reduced density of the skin (to make mechanical peeling easier), and reduction in moisture content for cassava being processed into chips or flours. The postharvest team recently received a Ford Foundation grant to enable them to develop machinery for processing other food crops.

IITA 37. Dr. Felix Nweke
Economist. Coordinator of the COSCA study, (Collaborative Study of Cassava in Africa). Extensive research on production and processing of cassava has taken place in six African countries under the leadership of Dr. Nweke. A number of other countries have joined the survey on their own funds. The benchmark sites are keyed into a GIS system as part of the project. In the first round, discussions were held with a focus group in each of the benchmark sites. Women were specifically asked questions and in some, but not all, sites, separate interviews were held with women in a group. Survey instruments used for later rounds are gender disaggregated throughout and instructions to those doing the survey include specifying whom should be asked specific questions. An analysis of the gender elements is currently being done.

IITA Dr. Sidi Modupe Osho

38. Food Technologist. Dr. Osho currently coordinates the IDRC-funded soybean utilization project. This is an example of how IARC initiated research on commodity utilization, in this case requiring collaboration with women as users of the product, has resulted in expansion of demand.

Until the mid-1980s, soybeans were grown in small amounts in Nigeria and IITA was conducting research to provide soybeans which yielded well without fertilizer, herbicides, or other chemicals. Beginning in 1985, at the urging of the Social Science Advisor, Dr. Natalie Hahn, IITA began working with clinics and training centers that feed improved foods to malnourished babies and teach mothers simple ways to improve diets using local foods. The focus of the project has been to incorporate soybean into traditional foods, some which can be cooked by individuals, some to be scaled up to commercial production. The intent was to improve the utilization of soybean, to improve diets and to generate demand. In Benue State, Nigeria, demand grew from 5000 tons in 1985 to 30,000 tons in 1990.

Dr. Osho has continued this action research program. Food technologists and home economists have been trained in rapid rural appraisal techniques, the importance of soybean as a nutritious food, and its compatibility with local recipes. Between 1990 and 1993, 47,000 Nigerians, of which 30,000 were women, have been trained in the incorporation of soybeans into traditional foods. The third phase of the project will extend the approach used in Nigeria to soybean production in Ghana, Cote d'Ivoire and Benin, all countries with limited soybean production and utilization. Research in Nigeria has included fortification of indigenous Nigerian foods with soybeans, development of soybean based weaning foods, development of food uses for various soy-based flours, use of soybean in production of dairy-like products, development of low-cost simple soybean oil refining processes, evaluation of oil presses constructed locally and testing of soybean breeding lines for nutritional and food processing properties.

IITA Humid Forest Program

39. Researchers working in the Humid Forest program indicated that there may be gender differences in the soil fertility of men's and women's plots as women's plots tend to be older and located closer to roads whereas men's crops are often found deeper in the forest and have had a longer fallow period.

IITA Dr. I.O.Akobundu

40. Weed Scientist. Working on the Moist Savanna program, two gender issues have emerged. One strategy is to control weeds through the use of a ground cover. Issues are raised as to whose labor is being reduced, who benefits from a groundcover such as cowpeas, and who contributes the labor for shelling and storage. Second, Akobundu reports that in many locales, men are the major

agricultural decision-makers and often show little interest in labor-saving weed control technologies since they consider weeding as "women's work".

IITA Moist Savanna Program

41. Scientists from the Moist Savanna program working in the Northern Guinea Savanna have tried a number of techniques to get data disaggregated by sex and age. They have had difficulties because in this region, women are generally secluded and cannot be interviewed by men. Project resources are insufficient to pay for female enumerators. Collaboration with women staff of non-government organizations (NGOs) has been a partial solution.

IITA Dr. Jean Tonyé

42. Agronomist. Dr. Tonyé works with projects of the AFNETA (Alley Farming Network for Africa). The project has identified several gender issues connected with attempts to introduce alley farming: (i)need to involve more women researchers and technicians, (ii) disaggregated testing and analysis of alley cropping and inclusion of low resource farmers such as women, (iii) increase of women's participation in field days, (iv) inclusion of gender-disaggregated information in the data base. He cited the fact that at the research site there is low acceptance by female-headed households; in joint households, women are constrained from planting. However, when husbands migrate off-farm for wage labor, women are left, untrained, to manage the farms. This suggests the need to train women in alley farming techniques, but that men's permission would probably be required.

IITA Dr. D.A. Florini and Dr. H. Bottenberg

43. Plant Pathologist, and Entomologist. Of the Plant Health and Management Division are working on cowpea in the savanna. They are interested in using gender disaggregated activity calendars and questions related to resource control for their characterization work. The cowpea team also uses taste panels from women's groups to evaluate cowpea leaves in sauces.

IITA Dr. N. A. Bosque-Perez and Dr. K.F. Cardwell

44. Entomologist and Plant Pathologist. During IITA's portfolio review, Dr. Bosque-Perez and Dr. Cardwell discussed the difficulty of identifying women farmers in surveys and other research related activities connected with studying aflatoxin problems in maize storage systems.

IITA Dr. Diane Russell

45. Anthropologist. This study of the Cameroon's forest zone was done as part of a concern with understanding how pressures on the resource base shape African farming systems particularly in areas of declining productivity. In theory, declining productivity can be arrested through adoption of intensive methods such

as alley cropping, managed fallows and integrated crop/animal husbandry systems. The humid forest zone faces particular problems, however, as the resource base deteriorates through tree-cutting and declining fallow time.

Dr. Russell's review of the research on the resource management systems of Cameroon's forest zone includes information that relates to gender issues that influence resource management. She notes that the precolonial division of labor was based on gender, age and social status (slave, client, noble) with specialization in artisanry, performance, rhetoric, warfare and hunting. A man's major agricultural task was to fell the great trees of the high forest for the first planting. Anything pertaining to wood was men's work. Other tasks accrue to men as well, including the planting of yams and that of determining which part of the forest to clear by the presence of certain trees and plants. Men also possessed the knowledge, based on the study of astronomy, to plan the agricultural calendar. With the establishment of cocoa as essentially a smallholder crop and the diminution of the power of chiefs, men, who were primarily warriors and hunters, became cocoa planters.

Traditionally women's primary agricultural tasks were seed selection, planting other food crops, soil preparation for yams and sweet potatoes, weeding, harvesting and transportation of crops. A wife was allocated land through her husband's clan and she was responsible for meeting the food needs of her husband and children. Responsibility for feeding the husband and his guests was rotated among wives in polygynous households.

Dr. Russell suggests that the changes in labor patterns can be studied through research into three areas: (1) general organization of agriculture labor at the village level; (2) changes in the division of labor; and (3) development of a labor market. Studies show that there is no "natural" division of labor; women can work on cash crops and cereals and men on food crops. The division of labor varies according to changes in demography, demand for different crops, and through struggle and negotiation. Very little is known about the development of a labor market, including availability of labor, compensation, categories of work, types of people using hired labor, the role of hired labor in the rural economy, and the difference in labor markets for different tasks (clearing, weeding). Changes in the gender division of labor are taking place and this may have implications for women's access to resources. As food crops gain in importance, men are saying that women now have more purchasing power than men do. As men become more involved in food crop production, they infringe on women's only means of acquiring income and feeding their families.

In closing, Dr. Russell notes that it is unlikely that extension services will be able to diffuse technologies for fallow management, which are complex and require

long-term planning. In order to build on farmer-experimentation two important areas for future research are the diffusion of technology and innovation at the farm level, and scientist-farmer interaction at the development of technology. (D. Russell. 1993. A Review of Research on Resource Management Systems of Cameroon's Forest Zone: Foundations and New Horizons. Resource and Crop Management Research Monograph No. 14. Resource and Crop Management Division, International Institute of Tropical Agriculture)

IRRI 46. Ms. Thelma Paris and Dr. Prabhu L. Pingali Agricultural Economists. The agricultural engineering division at IRRI has developed a number of machineries which reduce drudgery for tasks which are largely performed by women and which fit their ergonomic requirements. These have included micro rice mills, direct seeding equipment, transplanters, and threshing machines. In May 1994 a conference was held at IRRI on "Enhancing Incomes of Rural Women through Suitably Engineered Systems". A discussion paper by Paris and Pingali focused on whether agricultural technologies help or hurt poor farm women. The paper sets out the key dilemma, that is, the potential tradeoff of machines which reduce drudgery and increase productivity for women farming their own plots versus the loss of employment and income for female hired labor. Two examples illustrate their main point: that is, who is helped and who is harmed and what are the longer term effects depends greatly on the specific cultural and social characteristics of a particular location. Evidence from the Philippines indicates that the introduction of a mechanical thresher relieved both men and women of threshing and reduced the turnaround time. Rice farmers were able to grow a second crop of rice which in turn led to increased employment in transplanting, weeding, and harvesting. The benefits substantially outweighed the small cost of reduced opportunities for manual labor in threshing. In Bangladesh, introduction of a mechanical rice mill for a dekhi had a negative effect on poor and landless women who earned income providing hand pounding services. The negative effect resulted from cultural restrictions on women leaving their homestead for alternative employment.

The paper discusses how the interlinked local, national, and global markets will result in greater commercialization including migration to urban centers. This migration and increasing wage rates will make hired labor for agricultural production too expensive and lead to an increased demand for mechanization. The paper recommends that there should be careful definition of target groups in order to anticipate the consequences of introducing equipment, that the contractual use of small machines be explored, and that technologies be developed with a farmer and community participatory approach. (T. R. Paris and P. L. Pingali. 1994. Do agricultural technologies help or hurt poor farm women? Paper presented at the International Workshop on Enhancing Incomes of Rural Women Through Suitably Engineered Systems.10-13 May, IRRI.)

IRRI Ms. Thelma Paris and Dr. Graeme Quick.

47. Agricultural Economist and Engineer. A case study has been done on the introduction of a micro rice mill to a small village in Guimba, Nueva Ecija. The mill introduced by IRRI and PhilRice was carefully monitored as to its use and its costs and benefits compared to commercially milled rice in a nearby town, 7 km. distant. The mill was rotated between three clusters of the village. The operations were handled by three women volunteers. Once operations began, payment to these women for the opportunity cost of their labor (harvesting as hired labor) and direct costs were included in the fee. An interesting note is that when the women began earning an income as operators, their husbands took on a greater share of domestic, household responsibilities during the peak seasons.

The engineer revisited the village to hear women's comments and was able to correct most of the problems cited. The most important of these was to include a screen which separates rice hull from bran resulting in a fine bran which could be fed to swine, an important enterprise of women. The micro mill has benefited women in the village by reduced costs, reduced time, flexibility of time and the development of a village women's association. (T.R. Paris, C.P. Diaz, M. Hossain and A.B. Vasallo. 1994. The process of technology development and transfer to women: A case of the microrice mill in Guimba, Nueva Ecija, Philippines.)

IRRI Ms. Catalina P. Diaz

48. Sociologist. Since the mid-1980's, several scientists working with IRRI have explored the role of women in rice seed management. An early study on the results of training on seed management showed that there was a 10% increase in grain yield for the households where women and men who were trained selected seeds. Comparisons between farmer selected seed and certified seed stock are continuing.

A later study was made of two sites regarding the knowledge, attitudes, and practices of farmers with respect to seed management technologies. At the first site, an IPM course had been given involving 29 farmers of whom 4 were women; 59 farmers were interviewed. At the second site, non-IPM, 51 farmers selected at random were interviewed. The paper describes each specific operation done by farmers and which farmers did them. Responsibility for cleaning and storing seeds fell to men, to women, and to both jointly, each about a third. The population with the highest proportion of women predominantly in charge of seed cleaning was among the trained IPM group. This raises a question as to whether the training prompted men to turn over this task to wives or that the training should have been more directly targeted to women. In either case, the paper demonstrates that women are actively involved in seed management and training should be targeted to them as well as to men. (C.P. Diaz, J.S. Luis, T.R. Paris and M. Hossain. 1994. Knowledge, attitude and practice of seed management technologies in rice

farming in Central Luzon. Paper prepared for the Planning Workshop on Clean Seed for Pest Management, 27 June-2 July, Chiang Mai, Thailand)

IRRI Ms. Thelma Paris

49. Agricultural Economist. An in-depth study undertaken in East India looks at the situation in marginal areas as men migrate to nonfarm jobs. The situation of male and female migration and the effects on agricultural production are known through a number of case studies, but its dimensions are not known. The study looks at two stressed environments, one drought-prone which is favorable during years of high rainfall and one which is shallow and submergence-prone and favorable during low rainfall years. Both villages were populated primarily by lower castes and most of the land was held by higher castes. In one village, upper caste men hold higher-paying nonfarm jobs than lower caste men. Caste and gender interact in defining the circumstances of different farm households. Because of higher participation of high caste men in non-farm jobs, the participation of women in farm production is higher. However, most of this is done by women of lower castes as women of higher castes are confined to the homestead. This considerably increases the workload of lower caste women. The paper argues that the increasing workload of lower caste women and the supervisory responsibilities which will accrue to upper caste women whose husbands are absent warrant more attention to literacy, education and extension services for women; the inclusion of women in evaluating new rice varieties; and the introduction of input-intensive cultivars where households have access to non-farm employment and income. (T.R. Paris, Abha Singh and M. Hossain. 1994. Social consequences of stress environments. Paper presented at the Lowland Rainfed Consortium Planning Meeting, February 27 to March 6, Lucknow, Uttar Pradesh, India)

IRRI Dr. Sarah J. Tisch and Ms. Thelma R. Paris.

50. Agricultural Economists. These authors produced a paper that examined the gender effects of labor changes in the Philippines: "Labor Substitution in the Philippine Rice Farming Systems: An Analysis of Gender Work Roles." The effect of rice technology adoption on gender work roles of husbands and wives is examined in two rice ecosystems in the Philippines. Technology use is likely to be less labor-constrained if the work roles of men and women are flexible. Labor substitution between farming husbands and wives then occurs in response to economic pressures rather than being restricted by predetermined gender roles. The analysis of farm-level data from four villages indicates that work roles are more fluid than suspected and labor substitution occurs between husbands and wives in response to economic opportunities. The adoption of the labor-saving direct-seeded rice technique releases wives' labor on partially-irrigated rice farms more than on rain fed rice farms. (S.J. Tisch and T.R. Paris. 1994. Labor substitution in Philippine rice farming systems: An analysis of gender work roles. Rural Sociology 59 (3), pp. 497-514)

IRRI Dr. Prabhu Pingali

51 Agricultural Economist. A new study in Cabanatuan, Nueva Ecija is being undertaken in collaboration with the IPM-CRSP of Virginia Polytechnic Institute-State University. This study will focus on household decision making, knowledge and perceptions of crop protection management and will use both PRA and formal surveys.

WARDA Dr. Akinwumi Adesina.

52 Economist. Dr. Adesina is examining a number of issues related to women's roles in rice production in order to properly guide technology development programs to be gender sensitive. Although rice is often referred to as a "woman's crop" in West Africa, women's role in rice production varies depending on the rice ecosystem, socioeconomic and cultural factors and few generalizations are possible. It is clear that women are very important either as primary producers of rice or as principal suppliers of labor in most rice production systems. Despite their importance, several rice development programs have ignored women rice farmers; in cases where they are considered, it is often only after women exert pressure on project management. A common thread is the lack of access by women to improved rice lands, information, credit and new rice technologies. Experience in Asia and parts of Africa show that intensification of rice production systems leads to increased labor use. In a majority of cases, it is the labor shares of women that increases disproportionately due to increased demands for their input in transplanting, hand weeding, harvesting and threshing. The increased demand for women's labor often leads to "seasonal labor stress" on women as they combine field and household activities. Moreover, with men controlling the output, the benefits of rice intensification are rarely shared within the farm households. It is therefore important to determine the role of women in rice production systems, their access to new technologies and resources, and the impacts of rice intensification on their incomes, health and welfare.

The general thrust of these studies is to determine the impacts of rice intensification processes on women. The objectives of the studies are to:
(1) determine the role of women in rice production systems at different levels of agricultural intensification;
(2) determine the access of women to improved rice lands and improved rice technologies;
(3) quantify, using gender-differentiated farm programming models, the impacts of rice intensification on labor shares within farm-households, incomes and employment of women, and the productivity of communal, individual-male and individual-female fields; and

(4) measure gender-specific technical efficiency differences among rice farmers.

Results from analyses in Cote d'Ivoire indicate that women's labor share is significantly higher than that of men across all ecosystems, and that shares rise significantly with the progression from extensive rice systems to more intensive (irrigated) rice systems involving double-cropping of rice. Labor use also show distinct gender patterns depending on the type of field. In the extensive rice systems, except for the individual-male fields, women's labor use was substantially higher than men's on both individual-female and communal rice fields. In the intensive rice systems a similar pattern was observed, although in absolute terms women's labor use substantially increased with intensification. The results also show that the increased women's labor use in intensive systems was mainly in the most labor intensive activities: transplanting and weeding. This suggests that women's labor is critical for the intensification of the irrigated rice systems, and that the development of labor saving technologies for these operations would impact most on women. In addition, it was found that because women's time is taken up largely in the fields under the control of men, they are unable to perform adequate weeding on their own fields leading to a decline in the yield of women's fields. (A.A. Adesina. 1995. Women and agriculture: A critical assessment for a gender-sensitive technology research agenda for rice in Africa. Submitted to African Crop Science Journal. January 1995.)

WARDA Ms. Deirdre Birmingham

53. Doctoral extension education student at the University of Wisconsin. Completed field data collection of soil fertility management strategies in two regions in the humid forest and savanna zones of Cote d'Ivoire. The study is explicitly comparing mens' and women's local knowledge of soils and taxonomies for classification of soil types. Analysis is currently underway.

WARDA Ms. N. Fofana

54 Doctoral economics candidate at CIRES, the University of Abidjan in Côte d'Ivoire. Ms. Fofana is conducting a comparative study of women and men rice farmers in sites selected in the humid forest and savanna zones of Côte d'Ivoire. The study contrasts extensive upland rice production systems with more intensive lowland irrigated systems. Her foci are to determine difference in access to factors of production, time allocation to rice and non-rice enterprises (including domestic tasks) and resulting differences in technical, allocative and economic efficiency.

WARDA Mr. A. Diallo

55 Doctoral economics candidate at the University of Dakar in Senegal. He is conducting a comparative study of women and men rice farmers in sahelian small scale village irrigated perimeters along the upper Senegal River Valley in Senegal. His study will seek to determine difference in access to factors of production, time

allocation to rice and non-rice enterprises (including domestic tasks) and resulting differences in technical, allocative and economic efficiency.

3. Livestock and Livestock Systems

ICARDA Ms. Andrea Pape

56. Anthropologist. As her MSc thesis, Ms. Pape surveyed 74 bedouin households in close coordination with a male colleague who was doing a longer study with a larger sample. The objective of the study was to learn more about female as well as male roles and decision-making with respect to the farm and the household. The sample represented three farming systems--permanent mixed farming, semi-sedentary transitional bedouin system, and traditional (pastoral) bedouin system A standardized questionnaire was used and data were collected in single interviews with the female head of household. The work was assisted by a female Syrian translator. Data included a gender-disaggregated cropping calendar. The labor profile did not differ much between the three systems and is then described for women, girls, men and boys in sheep production, cereal production, household and off-farm employment. The study finds that two major activities for women are hand feeding sheep and milking and making of milk products. This indicates that women should be involved in the evaluation of new feeding management practices. Herding is principally the work of boys. Increasing sedentarization and male short term emigration for off-farm employment is leaving women with some more control over farm decisions. For transitional and pastoral women, who are generally poorer, much of their time is spent uprooting shrubs for fuelwood with negative environmental impact. The interview technique, including the use of a female researcher and translator permitted getting a fuller picture of the bedouin household. (A. Pape. 1994. Contribution of women to labour and decision-making processes in Bedouin families: An example from Syria. MSc thesis.)

ILRI Dr. Gary Mullins (ILCA)

57. Agricultural Economist. Milk demand on the Kenya coast is rising, but adoption of a dairy development package for smallholders has been limited. The area is also characterized by transition from an agricultural to a wage economy with many men working off-farm for wages. ILCA participated in collaborative research with the Kenya Agricultural Research Institute (KARI) and the National Dairy Development Project (NDDP) extension to understand the constraints to adoption. Structured questionnaires and informal conversations were held with 32 NDDP farm women, 15 from male recruit (extension contact person) farms and 17 from female recruit farms. This study is very interesting because of the evidence concerning the association of income receipts and of control of necessary resources with greater utilization of recommended practices and improved output.

Unpacking this analysis was complex. Across both groups, males were

predominantly the farm owners and females predominantly the dairy operators. Data gathered included type of cattle; milk production outputs, consumption and sales; identification of labor contributions for dairy operations by sex and age, and changes in labor allocation with acceptance of new technology package; distribution of income control by sex of recruited farmer and by dairy operator; access to and control over production resources by sex of recruit, operator, and owner; dairy unit performance according to NDDP guidelines by sex of recruit; and physical and financial responsibilities by sex of recruit.

The initial finding, stimulating further investigation, was that milk production per lactating cow was 6.8 liters on male recruit farms versus 11.5 liters on female recruit farms. Across all farmers, women did 48% of the labor, hired labor 25%, children 22% and husbands 5%, though there were variations by task. Adoption of intensive dairying, perhaps because of increasing pattern of men's off-farm employment, has resulted in increased labor for women on all farms, greater on the farms of female recruits. When disaggregated by 'recruit' as opposed to 'dairy operator', women were more likely to keep proceeds from milk sales (88%). On fourteen technical criteria used to evaluate dairy unit performance, female-recruit farms scored better or equal to male-recruit farms on ten criteria. Finally, in conversations about changes before and after the adoption of dairying, informants from female-recruit farms reported a higher percentage of expenditure on household welfare inputs such as school fees, school books, and food purchases than did informants from male-recruit farms. (G. Mullins, L. Wahome, P. Tsangari and L. Maarse. 1993. Impacts of intensive dairy production on smallholder farm women in coastal Kenya. ILRI.)

ILRI Dr. M.A. Jabbar and Dr. J. Smith (ILCA)
58. Agricultural economist and animal scientist. In the ILCA program based at IITA, these scientists are aware of the potential dilemma resulting from the increase in dairy production. Dairy processing is in the hands of women who may not have equivalent labor saving machinery to do the processing. However, introduction of commercial processing is likely to deprive women of an important source of livelihood.

ILRI Dr. John Curry (ILRAD) [left 12/31/93]
59. Anthropologist. As livestock disease control programs in Africa begin to rely more upon paraprofessionals and livestock producers as deliverers of animal health care services, understanding the role of different household members play in providing animal health care becomes increasingly important. Using a gender analysis framework, the authors collected data from a sample of 71 households in central Kenya. These households had earlier been part of a prevalence study of tickborne diseases. This pilot study was designed in part to identify linkages between livestock management and prevalence. An analysis of who does what,

who has what resources, etc. was done according to categories of sex and age, further divided by whether the head of household was male or female. In this case, the six female-headed households were further subdivided according to the inclusion or not of two rich widows whose holdings significantly skewed the means, particularly related to assets.

Adult women and elderly men in the sample have primary responsibility for livestock care, and are therefore well placed to diagnose illness. Dipping and spraying of animals to prevent tick-borne and other diseases is the primary responsibility of adult males. Decisions regarding use of milk from the morning milking are more likely to be made by adult men. It is morning milk that is most often sold. Adult women, however, make decisions about use of evening milk, which is most often kept for household consumption. Knowledge of livestock diseases did not appear to vary significantly by gender, although some elderly men did possess extensive knowledge of indigenous disease categories and traditional remedies. The study also points out the incongruity between those who are most likely to spot and treat disease (adult women and older men) and those who profit from livestock and who are likely to make decisions about treatment (adult men). An improved delivery system will have to take this division in knowledge, responsibilities, and benefits into account. The authors also suggest the potential for translating target diseases into local concepts by means of further work with the older men and adult women who have the traditional knowledge. (Reference: John Curry, Rebecca Huss-Ashmore, Brian Perry, and Adrian Mukhebi. 1993. Gender, intrahousehold dynamics and livestock disease control in Uasin Gishu District, Kenya)

ILRI Dr.Barry Shapiro (ILCA)

60. Economist. The intrahousehold income, resource allocation, and nutrition effects of peri-urban dairy production in Ethiopia. An ILRI/ENI/IAR/IFPRI research project (ENI: Ethiopian Nutrition Institute; IAR: Ethiopian Institute of Agricultural Research) is investigating the intrahousehold income, resource allocation, nutritional and health consequences of peri-urban dairy (PUD) technologies developed by IAR and ILCA. The study will result in policies to ensure that technology benefits are realized and equitably shared within household, and that they are realized as well across all types of household (including those that are resource poor). This research project builds upon past gender-related research done in Ethiopia by Dr. Shapiro, other ILCA scientists, and ILCA's partners.

ILRI Dr. Barry Shapiro (ILCA)

61. Economist. Food Availability Effects of Cross-Bred Cow Adoption in Selale. In Selale, about 150 Km north of Addis Ababa, crossbred cows and complementary management, feed production and feeding strategies were introduced by the Ministry of Agriculture from 1988 to 1991 as part of a diary project supported by

FINIDA, with a research component executed by ILCA. Since the end of the project, ILCA has been evaluating the effects of these technologies on farm households. One objective of ILCA's on-going evaluation work at Selale has been to study the effects of the crossbred cow technologies on food availability and labor allocation in households, by comparing 30 households with local cattle only (LBC) and 30 with crossbred cows (CBC).

While controlling for differences in farm size, per capita food availability (translated into monetary terms) was estimated to be almost double in CBC than in LBC households. However, while there was some increase in milk and butter consumption, most of the increase in food available for consumption was cereals (staple and other crops). Furthermore, CBC households actually spent less per capita on non-farm goods and services than LBC households. Thus, even if the income from fresh milk sales was controlled by men, it apparently went to increasing per capita food consumption and was not spent by the men on other non-food consumption items (such as drinking).

CBC households had almost doubled the number of total leisure days compared to LBC households. While the introduction of the crossbred cows raised labor demand for all agricultural activities, this increase was met by the men and women in the household, as well as by inter-household exchange labor (non-hired labor). The increase in leisure days due to the introduction of the crossbred cows is attributable to a reduction in the labor input of children from CBC households in livestock activities. This suggests that the children in CBC households may be more available to attend school, but this has to be confirmed empirically.

These study results leave important questions unanswered; the food intake of individual household members in CBC and LBC household and the nutritional consequences, including health and anthropometry; the effects of the new technologies on off-farm income activities, as well as the effects on the incomes, and household and childcare activities of women; what happens to the increased leisure time of children. These issues are being addressed in the ILRI/ENI/IAR/IFPRI research project listed as 61.

ILRI 62. Dr. Mohammed Musa and Dr. Barry Shapiro
Economists. New technologies may obscure the gender differentiated effects of technological change in a given farming system. As a consequence there may be displacement of women's labor from some farm activities, sometimes making the women economically worse off. However, simple technological interventions addressing production constraints in milk processing, for example, means achieving higher yields of milk production and surpluses for sale. With the collaboration of national and international institutions, ILCA has been involved in several research activities in the Ethiopian highlands to develop new technologies.

One of these technologies, the internal agitator, was developed by the ILCA Dairy Technology Unit led by Dr. Charlie O'Connor in south Ethiopia. Results show that with the use of the wooden internal agitator, the amount of butter products increases and the processing time decreases approximately three fifths compared with traditional processing methods. Milk processing in most smallholder milk production enterprises in Ethiopia is carried out by women and traditional processing methods are time consuming and inefficient. The introduction of the internal agitator allows farmers to produce more milk and butter for sale, providing them with ready cash for the purchase of such household items as food and agricultural inputs.

ILRI Dr. D. Layne Coppock

63. Animal Scientist/Ecologist. Married Boran women in Ethiopia perform many household and livestock management tasks. Interviews suggested that they spend 30% of their active time in the dry season hauling water for the household and collecting water and forage for young calves. A study was designed to quantify effects of two development innovations, water cisterns made of cement and storage of grass hay, on time budgets of women and water use. The activity budgets of a group of women were observed and quantified for a week. It was expected that interventions would have substantial, additive effects on saving women's time, and that more time would then be available for other activities. It was also expected that cisterns would increase water use. The results, however, ran counter to expectations: neither intervention had a significant effect of the budgeting of women's time. The cisterns increased water use of households, but this increment was given to calves, not people. Despite these findings, the people are interested in these interventions, and the major reason is the perceived savings in time. It is concluded from this that the interventions have greater implications for increases animal production than conserving women's time. (D. Layne Coppock. 1990. Effects of water and forage development interventions on women's time allocation and household water budgets in semi-arid Ethiopia: An experimental approach. ILCA.)

4. Trees and Tree Systems

CIFOR Dr. Ravi Prabhu, Dr. Lini Wollenberg, and Dr. Carol Colfer

64. Forester, Social scientist, and anthropologist. This team from the Production Management Program is testing sustainability criteria. The study includes social well-being in terms of impacts on women.

CIFOR Dr. Manuel Ruiz

65. Ecologist. Working with Peradeniya University and International Union for the Conservation of Nature, CIFOR is studying the collection of non-timber forest

products in Sri Lanka. The study will identify gender roles in collection practices.

CIFOR Dr. Manual Ruiz

66. Ecologist. A study of bamboo in China in collaboration with the Chinese Academy of Forestry looks at men's and women's roles related to bamboo.

CIFOR Dr.Manual Ruiz and Dr. Ousseynou Ndoye

67. Ecologist and Non-Timber Forest Products specialist. Marketing of Non-timber Forest Products in Cameroon. Dr. Ruiz and Dr. Ndoye are studying women's and men's roles related to marketing.

CIFOR Dr. Lini Wollenberg

68 Social scientist. A collaborative study by CIFOR, the University of Indonesia and the World Wildlife Fund - Indonesia Kayan Mentarang Project staff is looking at income generation and incentives for forest conservation. Roles of men and women in income generation and forest management; impact of income generation differentiated by gender will be incorporated into the study.

ICRAF Dr. Soniia David [left ICRAF 11/93; joined CIAT 12/93]

69 Anthropologist. Conducted several studies in which gender issues were explored: (1) gender differences in indigenous knowledge of soils; (2) baseline study on socioeconomic characteristics of households engaged in onfarm trials with a view to constraints to adoption by female headed households; (3) sex-specific information collected as baseline data for two other project sites: (4) study of rural household budgets in Western Kenya.

The latter study was an in-depth study of 30 households who were cooperators with the Maseno On-Farm Agroforestry Research Project. About one third of the households were headed by women and women were the main decision makers in half the households. Results indicated that most household have a budget deficit. Remittances from absent males is an important source of income but is usually restricted by the male decision maker to specific purchases. This may act as a brake on investment in agriculture and adopting certain agroforestry technologies such as hedgerows which need coppicing. Absent males may restrict spending on tree planting for fear that planting trees will give women a claim to the land. The study also indicates the value of trees for savings and insurance. (S. David. 1992. Household economy and agroforestry in Western Kenya. Mimeo. Nairobi: ICRAF.)

ICRAF Dr. Yves Guinand

70 Geographer. In an informal survey in Burundi, it was determined that farmer preferences for different species fell into three categories: (i) men and women preferring the same species for the same reasons, (ii) men and women preferring

the same species for different reasons, and (iii) men and women preferring different species for different reasons. A product frequently mentioned by women, but not by men, were the medicinal uses of specific trees. A later verification survey revealed that the proportion of female headed households was 35 percent and in some areas up to 55 percent. A further survey to compare preference activities and circumstances with regard to tree planting is being conducted.

ICRAF Dr. Susan Minae

71. Agriculture Extension Specialist. Gender issues have been integrated in ongoing agroforestry work in Malawi in two ways. First, the project emphasizes working with the household, rather than male farmers. On field visits, discussions are with both the husband and wife, and when possible include both in evaluation activities (invariably a difficult task).

With a women's group, the team is using a participatory approach to have the women identify the multipurpose tree species they would like to establish. The project provides inputs and technical information, but all planting and management is determined by the women farmers. Monitoring is in place.

ICRAF Dr. Don Peden

72. Range management scientist. In Southwest Uganda, the East African AFRENA (Agroforestry Research Networks for Africa which are coordinated from ICRAF) with assistance from the UNDP-Africa 2000 Network, has assisted ten women's groups under the leadership of Mrs. Alinemary Kemerwa to establish tree nurseries and to begin establishing agroforestry species on their own farms. The agroforestry program has become an "entry point" for wider community development activities and for plans for increased leadership training. Women formerly were not allowed to plant trees and in this instance have sometimes faced male opposition. One outcome is a new attempt to include men in their groups and rename themselves the "Two Wings Program". (D. Peden, W. Bamwerinde, A. Kemerwa and J. Okorio. 1993. Dissemination of promising MPTS: Issues and approaches. ICRAF; and W. Bamwerinde, D. Peden and F.Place. 1993. Economic evaluation of agroforestry nurseries by groups in S.W. Uganda. ICRAF.)

ICRAF Dr.Yves Guinand, and Leonidas Hitimana

73. Geographer and agronomist. Dr. Guinand and Mr. Hitimana conducted a study on women's preferences, knowledge and management of trees in Burundi. This participatory informal study seeks to analyze and assess women's opinions and attitudes to identify potential female adopters and users of agroforestry technologies. The study was conducted using informal guideline interviews with key informants, individuals and groups. Household lists of over 720 households in 6 different locations were drawn up based on interviews with key local informants. The Mbao-game, a traditional board game in Africa, was used to elicit women's

preferences of trees and people's eating habits. Frequently interviews included a farm walk which proved very useful for understanding all aspects of the production system. Households were stratified between de jure female headed households, de facto female headed households, and male headed households. The study focused on four main subjects relating to land and tree tenure, resources and enterprises, women's preferences, knowledge and management of trees, and knowledge acquisition and transmission.

The study has shown that relying only on the gender variable for determining preferences, management and knowledge of trees and tree products is not enough. Other factors may be important. The following factors have been identified as important to determine what target groups among women could be proposed as potential agroforestry technology users: (i) age and marital status, (ii) women's land and tree tenure rights, (iii) decision making process concerning trees, (iv) credit facilities, (v) women owning livestock, (vi) projects and extension workers addressing women, (vii) women's preferences in tree products, and (viii) group membership.

Regardless which target group among women should be addressed for proposed agroforestry intervention, the propositions have to be low input technologies in terms of time and capital. In general, women will not be able to manage high input technologies, because of lack of additional labor input and, therefore, may likely fail to adopt them. An exception may be self-help groups, where members can take turns for management, and share the labor and capital input. (Y. Guinand and L. Hitimana. 1994. Women's preferences, knowledge and management of trees: Results of an informal agroforestry survey in the high central plateau region in Burundi. AFRENA Report No. 91. Burundi: ICRAF/ISABU.

ICRAF 74 Dr. Keith Shepherd with J.K. Ndufa and E. Ohlsson.

Soil scientist, forester, agricultural scientist. In conducting on-farm trials in Maseno District of western Kenya, care was taken to include a proportionate number of female headed households (approximately 45%) and of different ethnic groups, as social stratifiers, as well as an appropriate mix of biophysical features of interest. In trials on hedgerow intercropping, researchers noticed that many of the women farmers did not coppice their hedges. Rather they had it done by male labor, either family or hired. In interviews, researchers learned that this task was felt to be too difficult, despite other difficult tasks done by women. This suggests that hedgerow intercropping which requires much coppicing is not likely to be adopted by households short of male labor. This research is being followed for several seasons. (J.K. Ndufa, E. Ohlsson and K.D. Shepherd. 1992. Participatory research methods for agroforestry technology development in Western Kenya. Paper presented to the 12th ASFRE Symposium, 13-18 September, Michigan State University.)

ICRAF Dr. David Ladipo

75. Agroforester. Dr. Ladipo, seconded to AFNETA (Alley Farming Network for Africa) from ICRAF and resident at IITA, considers gender an important variable in his work since men and women use different trees and shrubs for food and other purposes. In his survey of indigenous knowledge of MPTs, he talks to market women, housewives, male and female farmers, traders, and herbalists about their use of trees.

ICRAF Dr. Sara Scherr [left ICRAF 7/90; joined IFPRI 8/92]

76. Economist. A study of the outcomes of an agroforestry project in Kenya provided researchers with an opportunity to examine differences in agroforestry preferences and practices among different kinds of users. Users were disaggregated by sex; female respondents were disaggregated further by females with husbands present, females without husbands present, and females with no husbands. Comparisons are made on most common trees present, specific products for which trees were planted after the initiation of the project, percent of farmers selling different tree products, sources of fuelwood and building poles, site selection, and soil conservation and fertility practices. The comparisons demonstrate that disaggregation by gender alone masks important differentiation between women with different resources. This suggests that in future agroforestry and other agricultural and natural resource interventions, care must be taken up front to determine what categories of participants are most important for distinguishing between different sets of preferences and available economic and ecological niches. Informal interviews with key informants and groups and in-depth case studies will provide insights which can be used later for stratifying and preparing more quantitative surveys. (P. Bonnard and S. Scherr. 1994. Within gender differences in tree management: is gender distinction a reliable concept? Agroforestry Systems. Vol. 25. No. 2, February.)

5. Fish and Aquatic Systems

ICLARM Dr. Modadugu V. Gupta

77. Economist. The Bangladesh Fisheries Research Institute with technical assistance from ICLARM has used on-station and on-farm, farmer participatory studies to develop a simple technology which can be implemented by rural households without much strain on their financial resources or time. Of the sample of pond operators, 29% are women. In a separate study it was found that women predominate in seasonal pond aquaculture, making use of a technology which is low cost and easily accommodated in terms of time; men predominate in the higher cost more intensive perennial aquaculture. Because of Islamic restrictions, men predominate in field agriculture so that seasonal pond aquaculture undertaken by

women fits nicely into the existing farming system while adding protein and cash to family well being. (M.V. Gupta, M. Ahmed, M.A.P. Bimbao and C. Lightfoot. Socioeconomic Impact and Farmers' Assessment of Nile Tilapia (Oreochromis niloticus) Culture in Bangladesh. ICLARM Technical Reports 35; M.V. Gupta and M.A. Rab. Adoption and Economics of Silver Barb (Puntius gonionotus) Culture in Seasonal Waters in Bangladesh. ICLARM Technical Reports 41).

6. Protecting the Environment

CIAT Dr. Karl Muller

78. Soil Scientist. An existing women's group in the Colombian hillsides planted citronella erosion control barriers in their husbands' cassava fields in order to participate in a project to extract and market citronella oil. The organization had previously been exposed to the benefits of erosion control. Twenty km of citronella barriers have been planted. The extraction technology is still at the experimental stage, and marketing of oil has not yet started. However, this illustrates that it may be possible to induce adoption of soil conservation practices by capitalizing on the interest of women in earning independent incomes.

CIAT Cassava Program

79. Gender specific data being collected in the diagnostic surveys on hillsides: A Masters thesis is in progress (University of Wageningen) on women's role in decision making in agriculture in Cauca, Colombia.

CIFOR Dr. Neil Byron.

80. Forest economist. Dr. Byron and social scientists from the Chinese Academy of Social Sciences are studying the socioeconomics of the rehabilitation of degraded lands in China and Vietnam. The study will include an examination of intrahousehold roles.

CIFOR Dr. Louise Buck

81. Natural resource management. With NARS partners in Madagascar, CIFOR will study protected and peripheral area management systems. An examination of gender differences related to governance, knowledge systems and support for community-based protected area management will be included in the study.

ICARDA Dr. R. Tutwiler

82. Anthropologist. Past work in natural resource management studies limited to diagnostic studies that do include gender aspects in soil, water and rangeland conservation.

7. Saving Biodiversity

CIAT Dr. Jakob Kronik

83 Anthropologist. The role of indigenous knowledge in the conservation of biological diversity is being studied in three indigenous communities in the Colombian Amazon, differing in the degree of contact with outside agents. Focusing on one group of plants-palms--the project studies indigenous knowledge and indigenous use of palms, the process of developing and maintaining the stock of indigenous knowledge, and how this process changes under external contact. Based on previous studies that show that anthropogenic forests increase diversity, the project correlates the ecological composition of tropical moist forests with indigenous knowledge and use of species. The project assumes that the indigenous mode of life is the framework within which indigenous knowledge is generated. Therefore, given the known gender specific division of labor in these populations, the project analyzes the roles of various segments of population, such as men and women, old and young. The results are expected to make a methodological contribution towards strategies for in situ conservation of biological diversity (J. Kronik. 1994. The role of indigenous knowledge in using and conserving biological diversity of the Amazonian rain forest.)

CIMMYT Dr. Melinda Smale

84 Economist. In a traditional community of the Sierra de Santa Marta, a development project has recently introduced recommended practices for selecting maize seed from plants in the farmers' fields. It is known that breeders select their seed from plants in the field, which enables them to know more about key observable traits as well as factors related to physiological development of the plant. In this way, they are better able to control the outcome of their seed selection process. Generally, even in traditional communities of Mexico that are considered to be zones of origin, previous studies have shown that farmers usually select seed at or after the harvest, often in the home. In the Santa Marta project, where farmers have now tried recommended selection practices, their initial response has been positive -- they say that the practices help them maintain their materials, regardless of the maize type.

The mention of women's involvement in maize seed selection appears to be rare, but we have reason to assume that they select, within a wide range of landraces and varieties, ears that display traits related to important household uses (in addition to yield and other characteristics that are also considered important by both men and women). Our research question is first to establish whether our assumption is correct or incorrect, by maize type (landraces, improved varieties, hybrids). If so, we will do a case study of the dozen families to whom recommended practices were introduced over several growing cycles to : (1) observe the evolution of their seed selection practices; (2) establish whether the introduction of seed selection in

the field has a net effect on materials selected; (3) if (2) holds true, what are the implications for women's needs within the household; (4) if (2) holds true, what are the implications for the conservation of local genetic resources.

CIP Dr. Gordon Prain

85 Anthropologist. Coordinator, UPWARD program in Southeast Asia. CIP has established a program on the User's Perspective with Agricultural Research and Development (UPWARD) working with national scientists in southeast Asia on the collection and improvement of sweetpotato. The program has had three parts: methodology development, development of a research framework, and development (capacity building) of managers to do this work. From the beginning, there has been an explicit intention to look at all members of households as well as looking at the community as unit of analysis and to emphasize user participation in diagnosis and further research. The project has relied on workshops, small grants, and conferences to develop methodology and the capacity of researchers as well as information about sweetpotatoes and other root crops in Asian systems. There are research reports from China, Indonesia, Nepal, Philippines, Sri Lanka, Thailand, and Vietnam. In many places described, field clearing and land preparation are done by men while women carry out most other operations from cultivation of upland fields, preparation of planting materials to harvesting and postharvest. (G.D. Prain and C.P. Bagalanon, editors. 1994. Local Knowledge, Global Science and Plant Genetic Resources: towards a partnership. Proceedings of an International Workshop on Genetic Resources. Los Banos, Philippines: UPWARD)

CIP Dr. Virginia Sandoval

86 Anthropologist. An important element of sweet potato collection and conservation, largely undertaken by Dr. Sandoval, is developing the methodology for memory banking, that is retrieving farmer's knowledge about the cultivation, growth patterns, and morphological characteristics as well as farmer preferences of different varieties for specific agronomic or consumption niches. This will provide information on "what is in a variety", that is where it was grown, the range of its performance under different climatic or other stresses, and how it is used. This provides a richer picture of each variety and its potential than is available from the usual collection passport information and the evaluation of varieties grown out at the research station. In the publication listed below, almost every article cites specific steps taken to ensure that women were among the collaborators. (V. N. Sandoval. 1994. "Memory Banking": The conservation of cultural and genetic diversity in sweetpotato production In G.D. Prain and C.P. Bagalanon, editors. 1994. Local Knowledge, Global Science and Plant Genetic Resources: towards a partnership. Proceedings of an International Workshop on Genetic Resources. Los Banos, Philippines: UPWARD; and V. N. Sandoval. 1994. Memory Banking protocol: a guide for documenting indigenous knowledge associated with

traditional crop varieties. In G. D. Prain and C. P. Bagalanon, *op. cit.*)

CIP Dr. Gordon Prain and Maricel C. Piniero

87. Anthropologist and Human Ecologist. One study compares two attempts at in situ conservation or community genebanking. The authors hypothesized that two elements of social organization might be important: gender, because of the usual role of women in seed preservation and the formality or informality of the group. One group was a tribal settlement with a male leader and other male elders calling themselves "Livelihood for the People". The second group was an informal group of mainly immigrant women calling themselves "Industrious Mothers". Ethnic differences did not seem to play an important role in the social and agricultural organization. The groups structured themselves quite differently. The tribal authority was quite hierarchical whereas the women's group was relatively flat, slight precedence being given to the leader who had given the land. Over time, the genebank established on the tribal land devolved to the household and links to the land's owner. Except for land preparation, most of the work was done by women. The women's group also changed becoming more complex, more like a multiple social network based on a number of links. Men helped some of their wives with land preparation. The genebank planting arrangements differed between the two groups. Each woman planted a number of varieties in her garden and overall the gardens included a number of cultivars were planted with considerable redundancy (potentially useful for conservation purposes). In the situation of more formal authority in the tribal area, the diversity was pooled into a single, communal genebank. Another factor affecting the different sites were the longer familiarity of the women's group with the researchers who themselves were mostly women. The relationship was new in the tribal authority. Ultimately that genebank was ended early partly as a consequence of the loss of diversity between plantings . Women's interest in and responsibility for home gardening was seen as particularly conducive to preservation of biodiversity. (G. D. Prain and M.C. Piniero. 1994. Community curatorship of plant genetic resources in southern Philippines: Preliminary Findings. In G.D. Prain and C.P. Bagalanon, editors. 1994. Local Knowledge, Global Science and Plant Genetic Resources: towards a partnership. Proceedings of an International Workshop on Genetic Resources. Los Banos, Philippines: UPWARD)

ICARDA Dr. Larry Robertson

88. Legume curator, Genetic Resources. Germplasm collection and conservation. Recent landrace collection missions include a gender specific questionnaire on indigenous knowledge, production, and consumption

IPGRI Dr. Luigi Guarino and Dr. V.R. Rao

89. Genetic Diversity Scientists. A joint effort by IPGRI, the World Conservation Union, FAO, and UNEP has been made to develop a state of the art manual for

plant germplasm collectors. It pays particular attention to the collection of indigenous knowledge. The manual was reviewed by a CGIAR Gender Program consultant, Dr. Janice Jiggins, who found it very congenial to gender and to indigenous knowledge. (Guarino, Rao, & Reid. 1994. Manual for Plant Germplasm Collectors. IPGRI/IUCN/FAO/UNEP).

IPGRI Dr. Pablo Eyzaguirre.

90. Anthropologist. In 1995, as part of its new program on the social, economic and cultural aspects of genetic resources conservation and use, IPGRI will review existing research on women's custodianship and knowledge of genetic resources. This will contribute to the development of methodologies and guidelines for use in documenting genetic diversity and genetic resources conservation.

In addition, IGPRI's plant genetic resources collecting forms have been revised to include more ethnobotanical and socioeconomic information. Categories were included that allow plant genetic resource collectors to specify the gender division of labor and expertise in managing crop genetic resources. This should help to identify where women are the key sources of expertise and decision-makers in crop germplasm maintenance and use. The potential for enhancing women's participation for *in situ* conservation of plant genetic resources linked to development can be identified from the socioeconomic and ethnobotanical data stored along with the germplasm.

IPGRI Dr. Pablo Eyzaguirre

91. Anthropologist. IPGRI plans to undertake a project in Africa centered around the biodiversity of neglected leafy green vegetable crops. The project will document the indigenous knowledge on their diversity and uses within households and communities. Leafy green vegetables are grown and consumed in rural areas. Low income urban dwellers cannot afford commercial greens. The documentation of the diversity of the greens, their preparations and their uses as well as nutritional analysis will provide information for considering future prospects for nutritional programs and commercialization. Women are major producers and custodians of genetic resources on traditional leafy green vegetables. Local communities will be used as a starting point. Collaborative participatory approaches for collection, documentation, and conservation will have broader applicability.

8. Improving Policies

ICRAF Dr. Frank Place

92. Economist. Dr. Place conducted a study on the role of land and tree tenure in the adoption of agroforestry technologies. During the study his team addressed the rights of women and interviewed men and women separately. From informal

interviews it seems that women's lack of rights is a problematic issue with respect to increased agroforestry plantings.

ICRISAT Dr. Kimberly Chung [left ICRISAT 8/95]

93. Nutrition Policy. The research conducted by Dr. Chung and her colleagues from IFPRI and the Department of Health Education in India was focused on designing and testing alternative "quick and clean" indicators for identifying the food insecure. Individual, household, and village level indicators were examined. The indicators were tested to determine if they are reliable, cheaper to collect, easier to analyze, and less cumbersome to act on.

Conventional and alternative, including ethnographic and participatory, indicators were used to identify chronic and acute food insecurity and Vitamin A deficiency. Acute insecurity refers to wide swings associated with seasonality of food supply and shortages. An important component of the research was to include females as well as children in their surveys and other testing of indicators. This was justified because of the important, often sole, role women play in household food production. Alternative indicators were tested by overlap analysis; that is, the degree of overlap between the population in the indicator group and the food insecure as indicated by traditional indicators, such as household income or dietary intakes. PRA techniques--food chart, seasonality, and village mapping--were conducted with different groups stratified by sex and caste. The result is a list of indicators which are reliable in identifying the chronic and food insecure.

The indicators will be useful to organizations that want to identify the most food insecure households and individuals. National institutions or NGO's, for example, might use these alternative indicators to target interventions. CGIAR centers might use them to identify the most marginal households and therefore learn about their priorities and constraints to adopting new technologies. (K. Chung, L. Haddad, and J. Ramakrishna. 1994. Alternative Approaches to locating the food insecure: evidence from south India. Report to USAID).

IFPRI Dr. Eileen Kennedy [left IFPRI 1/94], Dr. Howarth Bouis, and Dr. Joachim von Braun [left IFPRI 1/93]

94. Nutritionist, Economist, Economist. Beginning in the 1980's, FCND undertook a series of studies of the entry of farmers into commercial agriculture. Their purpose was to examine the assumption that improvements to household income inter alia contribute to household food security and an improved nutritional status of all household members. Studies focused on changes in income, food expenditures, calorie consumption, and nutritional status of women and children.

The studies demonstrate that improvements in household income do result in increased expenditures on food and a smaller increase in calorie consumption.

However, the resulting increases in the energy consumption of preschoolers are well below appropriate levels and not commensurate with increases in income (Kennedy & Bouis 1993). In other words, cash cropping does not alone solve the problem of individual nutritional status.

Data showed that *who* controls the income also mattered. In Kenya, Rwanda and The Gambia, the amount of female-controlled income had a positive effect on household food security (von Braun and Kennedy 1994). In Kenya and Malawi, female heads of household from the poorest tercile who earned income were more likely to invest in food consumption for preschool children and have improved nutrition outcomes than higher income male-headed households (Kennedy and Peters 1992).

The implication of these findings for agricultural policy is that to increase household food security, technologies for the improvement of agriculture should reach the hands of both men and women producers and that the share of income controlled by women will likely result in improved nutritional status of family members, particularly children.

The effect of the commercialization studies is to indicate the value of intrahousehold analysis for determining both the outcomes of interventions designed to improve household welfare and the pathways by which such outcomes are determined. One result is that a substantially larger portion of IFPRI's research, particularly in FCND, is undertaken by collecting data disaggregated by sex, age, and sex of household head.

A second result is to examine a number of other areas related to household food security--credit, public works programs, structural adjustment, non-food contributions (such as health) to nutritional outcomes, women's time allocation, and the availability of micronutrients--to determine the gender related pathways and outcomes with respect to poverty alleviation.

A third result of the earlier studies is to undertake to examine gender and intrahousehold analysis more carefully. For example, does the tendency for a higher percentage of women-controlled income to go towards food expenditures represent a difference in the lumpiness of income rather than the sex of who controls the income? More broadly, when is gender an important variable and when is it not? Are there within gender differences which are significant for planning policy or technology interventions? Not all women nor all men are the same. At the individual, household, and community level, asset holdings, marital status, education, life cycle stage and local markets for wages and land often differentiate groups within "male" or "female". Regional and local culture and social structures are also important. These and related questions are being

examined through a multicountry project, MP17, on "strengthening food policy through intrahousehold analysis". (See below). (E. Kennedy and H. E. Bouis. 1993. Linkages between agriculture and nutrition. Washington, D.C.: IFPRI; E. Kennedy and P. Peters. 1992. Household food security and child nutrition: The interaction of income and gender of household head. World Development 20 (8): 1077-1085; J. von Braun and E. Kennedy, eds. 1994. Agricultural commercialization, development and nutrition. Baltimore, Md: Johns Hopkins University Press for the International Food Policy Research Institute).

IFPRI Dr. Jane Hopkins and Dr. Lawrence Haddad.

95. Economists. Gender or flow? The finding from the IFPRI commercialization studies (Entry 94, above) women-controlled income had more positive effects on household food security than did men's income has been subject to continued scrutiny to determine whether this outcome results from the regularity or lumpiness of payments or agreed upon division of responsibilities. An economic analysis of a gender and seasonally disaggregated data set from Niger tested for gender and flow of income in relationship to household food expenditures. Results showed that income and expenditures are not pooled and that seasonal income flows by gender are an important determinant of seasonal food expenditures. (J. Hopkins, C. Levin, and L. Haddad. 1994. Women's income and expenditure patterns: gender or flow? Evidence from Niger. Paper prepared for 1994 Annual Meetings of the American Agricultural Economics Association, 7-10 August.)

IFPRI Dr. Eileen Kennedy [left IFPRI 1/94] and Dr. Lawrence Haddad

96. Nutritionist and Economist. To test whether preschoolers from female-headed households were better off than those from male or joint headed households data sets from Ghana and Kenya were compared with respect to income level and preschooler nutritional status by gender of head of household. A distinction was made between de jure and de facto (male head absent over 50% of the time) female heads of household. In Ghana, married women living without a cohabiting husband are considered de jure. There is not a comparable category in Kenya. The Ghana data are analyzed differentiating between de jure--single, divorced, or widowed women--and married de jure, married women without husband. A comparison of per capita total expenditure (proxy for income) reveals that in Kenya, the de facto female-headed households are among the poorest and expenditures are 20% below the de jure households. In Ghana, the de facto female-headed households are among the richest and the de jure female-headed households among the poorest, but the difference in per capita expenditure between any female-headed and male-headed households is not significant.

What is the effect on preschoolers nutritional status? In Kenya, the poorest de facto female-headed households do as well or better (lower prevalence of malnourished children) than male-headed households; de jure households fall in between. In

Ghana, the de jure married households have the highest prevalence of malnourished children and de jure have the lowest prevalence. This does not vary significantly by household headship. This study indicates that (i) female headship is not an undifferentiated category; within and between sites there is variability in status, access to income, and nutrition outcomes and (ii) that factors beyond food expenditures may account for some differences between the Kenya and Ghana samples. In the latter case there is a poorer rural infrastructure for health services. (E. Kennedy and L. Haddad. 1994. Are pre-schoolers from female-headed households less malnourished? A comparative analysis of results form Ghana and Kenya. The Journal of Development Studies. Vol.30, No.3, April)

IFPRI Dr. Lawrence Haddad

97 Economist. Women's income and differential allocation to boy and girl children. Using data from Cote d'Ivoire, authors estimate that as women's share of income rises, it is applied in favor of boys rather than girls as measured anthropometrically in height for age. Authors attribute this to equity (boys' health endowments are poorer requiring more resources to equalize health status) and efficiency (boys may be responsible for care of widows) considerations. (L. Haddad and J. Hoddinott. 1994. Women's income and boy-girl anthropometric status in the Cote d'Ivoire. World Development. Vol. 22, No. 4)

IFPRI Dr. Lawrence Haddad, Ms. Christine Peña, and Ms. Alison Slack

98 Economists. Overview of research on poverty and nutrition within households. The review first lays out the economic, sociocultural and nutritional factors which shape asymmetries with respect to nutritional status within households. Nine topics are discussed with respect to the methodological issues related to each topic, available studies from each region (South Asia, Southeast Asia, Latin America, Sub-Saharan Africa), and conclusions with respect to evidence to date. The study closes with multi-country empirical analyses where the data is available. The nine topics included are (i) poverty and gender, (ii) female headship, (iii) female income, (iv) food distribution within the household, (v) distribution of nonfood health inputs, (vi) inferential discrimination: adult goods, (vii) anthropometric outcomes within the household, (viii) mortality, and (ix) Under reporting of negative results. (L. Haddad, C. Peña, and A. Slack. 1994. Poverty and nutrition within households: Review and new evidence. Paper prepared in collaboration with the nutrition unit of the World Health Organization, Geneva.)

IFPRI Dr. Marito Garcia [left IFPRI 7/3]

99 Economist. Women's nutritional status. IFPRI undertook a review in 1992 of 339 studies from the 1980's which included information on nutritional outcomes for women. The review addresses women at different life cycle stages--infancy and childhood, adolescence, reproductive stage, and the elderly--and examines a number of indicators. While the nutritional status of pregnant women has received

attention, that of non-pregnant and non-lactating women has received little. Principle indicators discussed are anemia (found to be deficient in non-pregnant as well as pregnant and lactating women), body weight, body height, body mass index, and mid upper arm circumference. The conclusion of the study is that the evidence strongly supports that the nutritional status of women is a problem of considerable magnitude. This has implications for women's well being, for the well being of the children they bear, and for their productivity. More work needs to be done with respect to indicators. There is considerable concern for the persistently greater prevalence of poor nutritional status in South Asia. (M. Garcia and M. Lotfi. 1991. Trends in women's nutritional status: Some implications for public policy. Paper presented at the workshop on the Effects of policies and programs on women, January 16, 1992. Washington, D.C.: IFPRI)

IFPRI Dr. Ruth Meinzen-Dick

100 Development Sociologist. An on-going study of the performance of smallholder irrigation systems has collected gender disaggregated data according to (i) whom an irrigated plot is assigned and (ii) who actually manages the plot. One question being asked is what difference does gender make on the productivity of land and water resource use in small holder systems in Zimbabwe. Zimbabwe's policy has been to assign irrigated plots to men on the premise that men will use it more productively and are more oriented to irrigated agriculture whereas women are more oriented towards dryland agriculture. One statistically significant finding of this study so far is that women are more likely to depend on irrigated holdings for income than do men. The research to date seems to show that irrigation systems in which the holders are predominantly women are doing better than those where holders are predominantly men. However, there are other variables such as the structure and size of the systems which may explain these differences and which will be investigated in subsequent rounds. (R. Meinzen-Dick, G. Makombe, and M. Sullins. 1995. Agroeconomic performance of small holder irrigation. In Performance of smallholder irrigation in Zimbabwe. University of Zimbabwe).

IFPRI Dr. Manfred Zeller

101 Economist. In a multivariate analysis of credit availability in Madagascar, it was found that gender plays no role in access to informal credit though it does in formal credit where women's access is more limited. (M. Zeller. 1994. World Development. Vol 22. No.12: 1895-1907.)

IFPRI Dr. Shubh Kumar

102 Nutritionist. Frequently new technologies result in shifts in labor allocations, income shares, and child nutrition with the introduction improved agricultural technologies. A rich and detailed study of the introduction of hybrid maize in Eastern Zambia found that while adoption was greater among farmers with larger landholdings (over 5 ha.), in the 3-5 ha. category, production efficiency was

greater. Hybrid maize has been adopted largely through expanded area and as a cash crop with farmers continuing to grow local maize for own consumption. The income potential of hybrid maize has resulted in men returning to farm from nonfarm jobs. This has impact in a number of areas.

Labor. The adoption of hybrid maize and acreage expansion increases both male and female labor, but the shares of women's labor to crop production is greater in local maize than in hybrid maize production. As area farmed rises, there is a drop per hectare in the labor of both men and women, but women continue to put in a greater share and their household labor also rises.

Adoption. Another important finding is that while adoption by female-headed households is lower at the smallest farm level (below 3 ha), it is higher than adoption by male-headed households at the 3-5 ha. level. This indicates the responsiveness of women farmers to improved agriculture when they have control of resources and income.

Women's shares. For women in male-headed or joint households other effects of the adoption of hybrid maize have been (i) reduced share of land farmed independently or jointly, (ii) reduced share of decision making, (iii) more time spent in household tasks, and (iv) reduced share of income. An analysis of the effect of hybrid adoption on nutritional outcomes is not clear cut. Where household incomes improve, as in the small farm adoption sector, nutrition of preschoolers improves. The share of income belonging to women also positively affects nutritional outcomes. The combination of reduced share of income for women among adopters and the lower income for large farms which are nearly universal adopters is correlated with poorer nutritional outcomes. Though both women's income share and more time on domestic tasks has positive effects on household food consumption, women's income share has the most positive impact, especially on children's nutritional status.

Dr. Kumar suggests that the reduced share for women in decision-making and income in hybrid maize production is one factor constraining improved productivity in smallholder agriculture, especially among the larger farmers. This might be addressed by improved extension and input services to women farmers, either independent or as part of joint households, and the introduction of processing and storage technologies which might encourage the use of hybrid varieties for food crops. (S. K. Kumar. 1994. Adoption of hybrid maize in Zambia: Effects on gender roles, food consumption, and nutrition. Research Report 100. Washington, D.C.: International Food Policy Research Institute.)

IFPRI Ms. Christine Peña, Dr. Patrick Webb [left IFPRI 5/94], and Dr. Lawrence Haddad

103 Economist, Geographer, and Economist. The authors reviewed donor experience with women's economic advancement through agricultural change. This review examines women-only projects, women's components of larger projects, and integrated projects. While the former two types have demonstrated the potential for enhancing the productivity of women in agriculture, donors are now agreed that mainstreaming gender considerations into regular projects will be more beneficial. The paper points out that mainstreaming must be accompanied by careful intrahousehold analysis including sociocultural factors which will affect the relative access of women and men farmers to the resources necessary for production, including their own labor. The paper ends with the challenge to research to undertake rigorous gender disaggregated data gathering and analysis to determine the foregone economic potential of women farmers. (C. Peña, P. Webb, and L. Haddad. 1994. Women's economic advancement through agricultural change: A review of donor experience. Report to the International Fund for Agricultural Development. Washington, D.C.: IFPRI).

IFPRI Dr. Lawrence Haddad and Ms. Lynn R. Brown

104 Economist and Development Economist. In an examination of studies of the intrahousehold effects of structural adjustment, it was determined that women are more frequently spectators rather than victims or players in structural adjustment. The authors suggest that initial, underlying asymmetries against women are the likely reason for differential effects rather that structural adjustment per se. This finding in a few sites suggests refocusing gender concerns on the deep structures which determine women's opportunities and constraints. (L. Haddad, L. R. Brown, A. Richter, and L. Smith. 1994. The gender dimensions of economic adjustment policies: potential interactions and evidence to date. World Development, forthcoming; and D. E. Sahn and L. Haddad. 1991. The gendered impacts of structural adjustment programs in Africa: discussion. American Agricultural Economics Association, December.)

IFPRI Ms. Lynn R. Brown and Dr. Lawrence Haddad

105 Development Economist and Economist. Time allocation data from seven countries (eight data sets) were analyzed to determine gender specific patterns of time allocation and where data was available, comparisons between male and female time burdens. Data came from studies done in Botswana, Ghana, Kenya, Zambia, Bangladesh, Pakistan and the Philippines. Analysis was undertaken on time allocation in productive activity, agricultural and nonagricultural productive time burdens, fuelwood and water collection, schooling and labor, and child care. The analysis indicates that broad conclusions are difficult with respect to individual time allocation patterns and burdens in different regions. It does support

the contention that women spend more hours in productive activities, including domestic production, than men.

The effect of agricultural intensification varies. In the Asian examples where land is constrained, rise in income is usually accompanied by withdrawal of female family labor from agricultural production and its increase in nonagricultural activities. In African examples, cash crop promotion and commercialization often take place through the expansion of cultivated land. This has implications for women's labor in sex-specific operations such as weeding, harvesting, and processing. Constraints to agricultural intensification can be found with respect to women's total time burden and with respect to seasonal demand for specific operations. This underscores the need to anticipate gender disaggregated labor availability and incentives with respect to specific operations and seasonality to anticipate and provide for constraints which limit increases in productivity. (L. R. Brown and L. Haddad. 1994. Time allocating patterns and time burdens: A gendered analysis of seven countries. Washington, D.C.: IFPRI)

IFPRI Dr. Lawrence Haddad

106. Economist. Several papers by Dr. Haddad and his colleagues examine theoretical models on household behavior describing unitary, bargaining, and collective models. These papers cite empirical evidence which challenges the relevance of a unitary model and lay the groundwork for IFPRI's continuing attention to improving the understanding and value of intrahousehold analysis. (L. Haddad, J. Hoddinott, and H. Alderman. 1993. Intrahousehold resource allocation in developing countries: methods, models and policy. Mimeo. Washington, D.C.: IFPRI; L. Haddad. 1994. Strengthening food policy through intrahousehold analysis. Food Policy 19(4) 347-356.)

IFPRI Dr. Agnes Quisumbing and Ms. Lynn R. Brown

107. Economists. Multicountry Project 17. Recently, IFPRI has regrouped its research into multicountry projects, each with a common theme. The policy issue addressed by Multicountry Project 17 (MP17) is "when and how can food and agricultural policy be improved through a better understanding of intrahousehold processes?" The objective of this MP is to undertake studies which provide more focused and empirically based insights into the value of gender analysis for policy. The project challenges the notion that gender is unimportant as well as the notion that gender analysis is the most important view for understanding poverty, agriculture, and the environment. In its own studies and in modules added to studies in other MPs, the project will examine critically the use of intrahousehold analysis to determining policy recommendations.

The key questions being asked are:

* who, if anyone, responds to a new incentive? and
* how are the costs and benefits associated with the response distributed?

For example, with respect to natural resources, who are the users? What are their incentives to slow down processes of degradation? Can these be affected by policy? What are the costs and benefits of the changed behaviors and who is affected? To address questions such as these, MP17 will work collaboratively with other IFPRI MPs which address issues of credit, labor markets, water resource allocation, fragile lands, forest margins, micronutrients, nutritional monitoring, property rights and collective action. Researchers from three divisions (Food Consumption and Nutrition, Environment and Production Technology, Markets and Structural Studies) will incorporate sex- and age-disaggregated data into their research as well as other gender-relevant questions. The cross-country and cross-project data will allow researchers to examine closely methodologies for getting and analyzing intrahousehold data, and the contribution of such efforts for useful insights to particular areas of research.

IIMI Ms. Margreet Zwarteveen

108 Irrigation engineer. Associate gender specialist. The main objective of her work with IIMI is to analyze the relations between gender and the performance of irrigation systems. Beginning in 1992, studies at a number of IIMI sites, specifically in Bangladesh, Burkina Faso, Nepal, Niger, and Sri Lanka were taken. The studies aim to document how men and women are involved in irrigation related activities (agriculture, management and maintenance); analyze if and where women and men have different interests with respect to irrigation; identify how women and men (are able to) defend those interests; and examine how identified gender biases in the design or management of the irrigation system influence the performance of the system. These are reported below.

Another major goal of IIMI's gender program is to integrate gender issues in all of the other projects and programs IIMI is involved in. This proves to be quite difficult. Maybe the main reason for little impact so far is that few IIMI studies include the household level. IIMI is mostly concerned with performance and management issues at irrigation system level or higher. Gender is often only of indirect concern at those levels. Also the fact that most water users' organizations (especially in South Asia) consist mainly of male members makes it difficult to recognize gender as a structuring determinant in irrigation performance.

In addition to the other studies cited below, Ms. Zwarteveen has prepared a number of other papers on irrigation management, irrigated agriculture and gender.

K. Athukorale and M. Zwarteveen. 1994. Participatory Management: Who Participates? In: The Economic Review 20 (6): 20-24, University Wageningen, The Netherlands.

M. Zwarteveen. 1992b. Gender and Irrigation Management: A New IIMI Program, paper presented at the International Workshop on Gender Concerns in Rice Farming -- IIRI, October 20-25, Chiang Mai, Thailand.

M. Zwarteveen. 1993a. Gender and Irrigation Management: Issues and Challenges. Paper presented for SIDA workshop on Gender and Water Resources Management: Lessons Learned and Strategies for the Future, Stockholm, December 1-3.

M. Zwarteveen. 1993b. Gender and Irrigation in Pakistan: Some Considerations for Donor Assisted Projects. Discussion Paper for the Gender Training Course organized by the Royal Netherlands Embassy, May, Islamabad, Pakistan.

M. Zwarteveen. 1994a. Gender Issues, Water Issues: A Gender Perspective to Irrigation Management. Working Paper No. 32. International Irrigation Management Institute (IIMI), Colombo, Sri Lanka.

M. Zwarteveen. 1994b. Gender Aspects of Irrigation Management Transfer: Rethinking Efficiency and Equity. Paper presented at the International Conference on Irrigation Management Transfer, Wuhan, China, September 20-24.

IIMI Ms. Margreet Zwarteveen
109 Irrigation engineer. Bangladesh: A process documentation study here focusses on ways and strategies to increase the access of poor women to irrigation technologies and irrigation related agricultural support services. The Grameen Drishi Foundation has a strong mandate to focus on women, stemming from a poverty alleviation objective. Women groups are stimulated, assisted and trained to purchase irrigation equipment and attempts are made to train landless women groups to manage Deep Tubewells. The special Program for Women is still in its early phases, and experimenting.

IIMI Ms. Margreet Zwarteveen
110. Irrigation engineer. Burkina Faso. A case study was conducted in 1994 that focusses on a comparison between households in which only men have been allocated irrigated plots and those in which women also have received plots, in terms of labor allocation, productivity and impacts on household welfare and women. Preliminary findings show that overall household labor contributions per ha increase when plots are also given to female household members; there is no difference in productivity between male and female plots; the allocation of plots

to women does not significantly decrease their labor contribution to the collective rainfed fields, but rather decreases their labor to their individual rain fed plots. Benefits of both female and male plots are primarily used to supplement cereal deficits (millet harvests being on the decline because of soil degradation and drought), but surpluses are controlled by the plot owners. Women use part of their harvest to assist their parents and other family members.

IIMI 111 Ms. Margreet Zwarteveen

Irrigation engineer. Nepal. A one-year case study was finalized in 1994. The Nepal study focussed on analyzing the discrepancy between women's high participation in irrigated agriculture and their low involvement in the water users' organization of a farmer managed irrigation system (the Chattis Mauja). A major study finding is that the absence of female farmers in the irrigation management organization works to the advantage of women, but to the disadvantage of the overall performance of the organization. The fact that women are not formal members makes it difficult for the organization to enforce the rules with respect to water distribution and labor mobilization on women. As a result, many women are taking more water than they are entitled to while at the same time contributing less labor for maintenance than they should (M. Zwarteveen. 1993. A Gender Perspective to Irrigation Management, paper presented at the IIMI/IOE Seminar Series on Irrigation Management, 23-7-1993, Kathmandu, Nepal; M, Zwarteveen, N. Neupane and U. Pradhan; and M. Zwarteveen. 1994. Gender Aspects of Irrigation Management: The Chattis Mauja Irrigation System in Nepal, paper presented at the tenth IIMI Internal Program Review, November 1994, IIMI, Colombo, Sri Lanka).

IIMI 112 Ms. Margreet Zwarteveen

Irrigation engineer. Niger. A six-month case-study was conducted in 1994. The study focussed on documenting women's involvement in irrigated agriculture and irrigation management as compared to men's, with the objective of formulating some very practical recommendations on how to better take gender into account in management and support service provision. The main study findings are: In the rice growing perimeter, almost all family labor to irrigated rice production has been replaced by hired labor. Women especially do not engage in any field related activity in rice production. This is because rice is used as a subsistence crop and the provision of cereals to the household is considered a man's responsibility. In the vegetable growing perimeter, involvement of women in higher. Women increasingly ask their husbands to be remunerated for their labor contributions to the collective male-controlled fields, and withdraw their labor if remuneration is not forthcoming. During project implementation, no land was allocated to women, although women lost land because of the project. Women expressed interest in obtaining access to irrigated plots, but for the cultivation of vegetables rather than for rice.

In 1995, some of the recommendations of the 1994 study are being implemented by the Niger project. Activities include the incorporation of gender modules in training and the inclusion of gender in on-going studies (M. Schaap, M. Zwarteveen, and F. Dadi Barmou. 1994. Relations Genre et Management de l'Irrigation. Cas des Perimetres de Saga et Tillakaina, Unpublished Field Report, Niger).

IIMI Ms. Margreet Zwarteveen

113 Irrigation engineer. Sri Lanka I. A two-year case study started in 1993 that focusses on documenting and understanding women's roles (as compared to men's) in irrigated agriculture and irrigation management, with an emphasis on analyzing and understanding their actual and potential participation in water users' organizations. Preliminary study findings show the high contributions of women to irrigated agriculture, especially in middle-class and poor households. In terms of production performance, a good understanding and collaboration between husband and wife has been identified as a major factor contributing to high productivity. With respect to irrigation management; the lack of participation and interest in participation in water users' organizations by women in mainly the result of the poor functioning of these organizations, especially for women. Women have better and alternative means of getting their irrigation related problems solved, like directly meeting with irrigation officials (IIMI. 1994. Gender Issues and Irrigation Management: First Annual Progress Report for 1993/94, submitted to the Dutch Ministry for Foreign Affairs, Section on Women and Development, Colombo, Sri Lanka).

IIMI Ms. Margreet Zwarteveen

114 Irrigation Engineer. Sri Lanka II. There is an NIRP-IRMU project "Strengthening farmer organizations through increasing participation of women." A survey and study to result in an Action Plan with practical recommendations to the Irrigation Department on how to improve the gender balance in Farmer Organizations. This study is currently in the design phase.

ILRI Dr. Barry Shapiro (ILCA)

115 Economist. Women and Joint Women-Men Centered Nutrition Education Study. This program will determine whether and what type of micronutrient educational activities could reduce the constraints to women and pre-school children reaping the benefits of increased availability of dairy products. This research is being funded by USAID through the International Center for Research on Women. The study will investigate differences in nutritional outcomes from targeting educational programs to women, and women and men jointly.

This research will seek to actively involve women, as well as men, in defining the constraints they face in reducing micronutrient deficiencies, identify and test

proposed program modifications, and evaluate their success. Women play key roles in milk production and processing, as well as in income generation through dairy product sales and food purchases. There is growing evidence, however, that even though women and children are often most at risk within the household, nutrition education programs that solely target women and disregard men may not be effective. Men may subvert program goals when they do not understand the consequences of their actions.

Fortifying NARS

9. Training

CIAT Dr. Jacqueline A. Ashby

116. Anthropologist. Since 1987, Ashby has been administering a training and research program to develop training tools for participatory farmer evaluation of experimental materials and practices produced by agricultural research. These tools include explicit attention to insuring that both women and men are included as collaborators. The discussions of farmer criteria for evaluation makes clear that men and women may have different sets of preferences depending on their role with respect to the commodity. (J. A. Ashby. 1990. Evaluating technology with farmers: a handbook. Cali, Colombia: CIAT; C. A. Quiròs, T. Gracia, and J. Ashby. 1991. Farmer Evaluations of Technology: Methodology for Open-Ended Evaluation. Instructional Unit No. 1. Cali, Colombia: CIAT)

CIP Dr. Patricio Malagamba

117. Physiologist, Training Director. CIP currently includes discussion of gender and a user perspective in six courses: (i) Political macroeconomics, integracion regional y sistemas Andinos de alimentos, el caso de la Papa (Peru); (ii) Indigenous knowledge in conservation of crop genetic resources (Indonesia); (iii) Vines to the roots, Sweepotato breeding for impact (Peru); (iv) Curso internacional sobre mantenimiento, caracterizacion y evaluacion de germoplasma de Camote (Mexico); (v) Taller Nacional sobre impacto institucional del MIP. (Peru); (vi) Curso internacional de manejo integrado de plagas de Papa-Curso piloto de capacitacion a distancia (Bolivia). This last course was a pilot in distance learning. The course on indigenous knowledge held in Indonesia does include content specifically on women's roles in agriculture.

ICRAF Dr. Habib Ibrahim, Mr. Jan Bienest, and Dr. Steven Franzel

118. Training. ICRAF has included gender analysis in their primary training material, "Diagnosis and Design Training Exercise Book." Research methods which incorporate gender are included "Diagnostic Tools:"

-semi-structured interview (SSI)
-gender resources map
-seasonal activity by gender and age
-labour and resources charts: gender and age division; benefit analysis flow chart
-farming systems
-agroecological system
-ranking

The training is integrated into its main course on agroforestry "Agroforestry research for development" which in 1994 was held twice at headquarters and twice in South Africa.

ICRISAT B. Diwakar

119. Training Officer. ICRISAT includes content pertaining to gender analysis in two group training programs: In-service six month training program and Pigeonpea processing and utilization. It is also offered as part of research scholarships for crop quality and utilization. One or two lectures on the concept of gender analysis are included in the agricultural research and extension course and in the training curriculum of the Economics Division. For all these trainings, ICRISAT uses its video "Participatory Research with Women Farmers".

IITA Dr. Jim Gulley

120. Head of Group Training. With assistance from the CGIAR Gender Program and IRRI, the group training division has been introducing a gender component into IITA's production and other courses. In February 1993, Gulley brought together a gender research committee for IITA. The committee has taken the initiative in sponsoring lectures by IITA scientists who are doing gender related work and the visit of a consultant from the Gender Program to conduct workshops and a portfolio review with IITA scientists.

IITA's training materials include material where gender analysis is integrated into the projects, including those done in collaboration with the Ghana Grains Development Project (see Entry 25). 1995 Group training courses which include a gender perspective are (i) Crop management research on cowpea and soybean (Zambia), (ii) Postharvest research on selected food crops--banana and cassava (Uganda), (iii) Crop management research on root crops (Ghana, Tanzania), (iv) Crop management research on grain legumes (cowpea, soybean and groundnuts; Ghana). Modules which are used include (i) Who does what?, (ii) Cropping calendar, (iii) Gender analysis in Agricultural production, (iv) Gender analysis in Crop production in Ghana, and (v) Gender and development approach.

The training division also conducts Participatory Rural Appraisal training for IITA research and training staff to enable them to focus on gender issues in agricultural research among other benefits of PRA. Similar training was given in training of trainer workshops for NARS scientists.

IRRI Ms. Anita Frio

121. Agricultural Economist and Trainer. IRRI has done the best job of all training programs seen so far in integrating gender into regular IARC group training programs. This includes those programs which are now being decentralized to NARSs. A number of modules have been developed such as a slide show entitled "What do you see that I don't?" which encourages careful observation of "who does what". Two case studies are used: one on the work of IRRI researcher Thelma Paris on Sta. Barbara, Pagnasinan and a second, "Why No Milk for the Plant?" which illustrates the failure of a project because planners did not consult the users. The IRRI training program also uses village mapping, videos from CIAT, ICLARM and ICRISAT, exercises built around gender disaggregated cropping calendars, and an exercise on transepts. Each has gender woven in as one of the variables for which information is collected and which is analytically considered. Many of these tools were developed in collaboration with Thelma Paris and Women In Rice Farming Systems collaborators. The training division also holds a two week course specifically on gender analysis and its application to rice-based farming systems research.

1995 courses which include gender are: (i & ii) Adaptive research with a farming systems perspective (IRRI and China); (iii) Frontiers of social science research methods for agricultural systems analysis (IRRI); and (iv) Gender analysis in agriculture, forestry and natural resources (Philippines in collaboration with IIRR).

WARDA Dr. Anthony Youdeowei

122. Training Director. In 1991, WARDA initiated a special program for training of West African women to become trainers in rice science. The idea behind the program is to train women with a basic background in agricultural science to become trainers who would return to their countries to organize similar training for other women as well as train women rice farmers. In this manner they will be helping NARS in providing research for and technical assistance to women rice farmers.

10. Documentation, Publications, Information Dissemination

CIAT Ms. Dorien van Herpen

123. Home economist. One of the controversial aspects of gender analysis is that it is considered to be site specific, and, therefore, it has been argued that NARS, rather

than IARCs have a comparative advantage in gender analysis. The innovativeness of van Herpen's paper lies in its illustration of the role of strategic research in gender analysis. It synthesizes case studies from all over Latin America to identify continent wide patterns in the role of women in agriculture. Participation of women is related to factors such as farm size, income, racial origin, and food/cash crop production. This type of analysis, particularly if extrapolated with the aid of GIS, makes it possible for findings of gender analysis to feed into the process of strategic technology development by international centers. The paper also indicates other opportunities for strategic research in the field of gender analysis, such as the relationship between agroecology and the role of women, hypothesized trends in female participation, such as the feminization of agriculture in Latin America. (D. van Herpen. 1991. The participation of women and children in Latin American and Caribbean Agriculture. In: Gender Analysis in Agricultural Research, Proceedings of an internal workshop. CIAT.)

CIAT Ms. Dorien van Herpen and Dr. Jacqueline A. Ashby

124. Home economist and Anthropologist. In 1991, the CIAT Working Group on Gender Analysis led by Dr. Ashby held a two day internal workshop on "Gender Analysis in Agricultural Research" for thirty senior scientists and management at CIAT including the Director General and Deputy Directors General. This workshop is the most comprehensive The workshop was a mix of exercises which raised awareness on the role of gender in agricultural research, presentations by a leading Latin American scholar and working group discussions, and extensive working group discussions. The working group discussions discussed several topics each under (i) the role of gender analysis in particular areas of CIAT's research program and where more information was needed and (ii) action points. The publication provides useful material for institutions wanting to hold their own internal workshops on gender analysis. (D. Van Herpen and J.A. Ashby, editors. 1991. Gender Analysis in Agricultural Research.)

CIMMYT Dr. Derek Byerlee

125. Economist. CIMMYT Economics Program published in 1993 a guide for survey design for studying the adoption of agricultural technology. The guidelines are an excellent example of how attention to gender is integrated into the broader methodology. Under characteristics of the farmer, gender is a separate category with text which ties the 'who does what' question into the implications for adoption decisions. This is illustrated with excellent examples from Nepal, Malawi, and The Gambia. The importance of hearing from women farmers is carefully discussed in the section on the sampling frame. (CIMMYT Economics Program. 1993. The Adoption of Agricultural Technology: A Guide for Survey Design. Mexico, D.F.: CIMMYT)

CIP Dr. Ana Maria Ponce

126. Telecommunications. Dr. Ponce is responsible for INFOANDINA activities, the information hub for CONDESAN focused on natural resource management and ecoregional development. In collaboration with FLACSO, Ms. Ponce is developing the setup of a Gender listserver hosted in Ecuador. FLACSO will convene a group of gender specialists in the Andean region working on issues related to natural resource management. CIP/INFOANDINA will provide seed money to pay the partial time of the list moderators and traffic costs.

ICARDA Dr. Lamia El-Fattal [Consultant to ICARDA]

127. Planner. Dr. El-Fattal has prepared several materials which consolidate information on women's role in agriculture in the WANA region. Such information is scarce. These documents provide a context for ICARDA's future work using gender analysis. The documents are available from ICARDA.

-"Women in agriculture in West Asia and North Africa: a selected listing of researchers and institutions" compiled by L El-Fattal, " ICARDA Gender Consultant with support from CGIAR Gender Program, 1994. This material lists the international and West Asia North Africa (WANA) based institutions and researchers with expertise in women in agriculture in the WANA region. Most useful for the WANA region are the lists of contacts interested in gender issues in agricultural research institutions as well as in women's studies centers.

-"A Reader on Women in Agriculture in West Asia and North Africa" compiled by L El-Fattal, ICARDA Gender Consultant with support from CGIAR Gender Program, 1993. This document lists the readings most relevant to researchers with a specific interest in women in agriculture in the WANA region. All the materials listed are on file in the ICARDA library.

-"Women in Agriculture in West Asia and North Africa: A Review of the Literature" report by L El-Fattal, ICARDA Gender Consultant. 1995. This is a excellent and comprehensive study of the published materials which include information on women and agriculture in the WANA region. Dr. El Fattal found that (a) WANA is unrepresented in general with respect to publications on women and development and (b) most studies on women are with respect to their roles in urban settings or in village structures, but not agricultural production itself. The document first reviews the literature available indicating the orientation of the researchers and the value or not of particular approaches to an improved understanding of women's roles in agriculture. Drawing from that diverse and scarce literature, the review then considers women's participation in agricultural work, i.e. their participation in the labor force, changes in their participation in the agricultural labor force. Next she analyzes the gender division of labor in WANA with more specific discussion of women's roles in livestock and crop production.

She then examines the factors influencing their participation, specifically wages, ownership of land and livestock. The action of institutions in addressing gender issues and hiring of women scientists is also presented. The publication closes with a number of specific suggestions as to the implications of this material and what is not known for future agricultural research in the region. Emphasis is given to ex ante and ex post impact assessment and to the incorporation of gender analysis into characterization studies and on-farm and on-station trials.

ICLARM Dr. Clive Lightfoot [left ICLARM 1/95]

128. Agronomist. Dr. Lightfoot and his colleagues developed a method for community participation in agroecosystem mapping with a gender perspective. The guidebook cited below includes notes on interviewing and preparing conceptual diagrams as well as discussion of intrahousehold access to and use of resources. Very useful primer and among the first to specifically bring in gender as a variable in participatory rural appraisal and agroecosystems analysis. (C. Lightfoot, S. Feldman and M. Z. Abedin. 1991. Households, Agroecosystems and Rural Resources Management. ICLARM)

IFPRI Dr. Agnes Quisumbing

129. Economist. One of the first products of the multicountry project on intrahousehold analysis (MP17) was a food policy report on women, and food security. In a reader friendly document intended for wide circulation the report summarizes clearly the evidence on women's importance in these agricultural production, economic access to food and nutrition security. (A.R. Quisumbing, L.R. Brown, H.S. Feldstein, L. Haddad, C. Peña. Women: the key to food security. Food Policy Report. Washington, D.C.:International Food Policy Research Institute).

IFPRI Dr. Ruth Meinzin-Dick, Ms. Lynn R. Brown, Dr. Agnes Quisumbing, and Dr. Lawrence Haddad

130. Development Sociologist and Economist. IFPRI inaugurated in 1994 an E-mail network on gender and intrahousehold analysis, Gender-CG. It runs as a list server and currently has over 183 participants from 29 countries. It has put out two newsletter this year which summarizes the network dialogue. In September, IFPRI launched an E-mail conference on gender and property rights in land, water, and trees. This is a pilot effort combining the mailing of papers with conversations over E-mail and the possibility of sending in comments by fax. This conference has over 130 participants from 26 countries.

IIMI Ms. Margreet Zwarteveen

131. Irrigation engineer. For the December 1992 FMIS, Newsletter of the Farmer-Managed Irrigation Systems Network, 'Gender Issues and Irrigation: Some Experiences and Initiatives' prepared by Ms. Zwarteveen was featured with

a series of short articles on experiences from Thailand, Pakistan, Bangladesh, the Netherlands, India, South India, Indonesia, Tanzania, and Andhra Pradesh, and India. Some of the findings reported are: formalization of irrigation schemes can sometimes lead to reducing women's involvement if only one member of the household is registered in the scheme (Thailand); even under purdah ideology, women play an active role in irrigated agriculture, including being full-time irrigators, keepers of cattle, and providers of meals for laborers; all irrigators are being hurt by the decline in productivity because of increased salinity of the water (Pakistan); gender disaggregated information on women's and men's production activities prior to planning an irrigation scheme usually reveals distinct roles and constraints which can be effectively integrated into planning (Tanzania, Indian projects).(M. Zwarteveen. 1992a. Gender issues and Irrigation: Some Experiences and Initiatives. In: Newsletter of the Farmer-Managed Irrigation Systems Network (FMIS) No. 11, International Irrigation Management Institute (IIMI), December, pp 1-2, 4-8

IPGRI Ms. Ruth Raymond

132 Public Affairs Officer. In 1991, IPGRI devoted its annual magazine, Geneflow, to an excellent overview of women and plant knowledge and conservation. In August 1995, IPGRI published The Forgotten Farmer. This booklet clearly describes the roles of women in maintaining biodiversity, especially through their roles as food providers. It also highlights the innovative work by CGIAR scientists, including especially women scientists, in learning from and addressing the needs of women farmers. (IPGRI. 1991. Geneflow: Special issue on women and plant genetic resources. Rome: IPGRI; and IPGRI. 1995. The Forgotten Farmer. Rome: IPGRI.)

11. Organization and Management Counseling

ISNAR Dr. Dely Gapasin [left 12/93], Dr. Deborah Merrill-Sands, Dr. Edwin Brush, and V. Mabesa

133 Entomologist/Resource Management, Anthropologist, and Scientists. In collaboration with scientists from the Philippine Council for Agricultural, Natural Resources, and Forestry Research and Development (PCARRD), Gapasin and Merrill-Sands studied the integration of women scientists into agricultural research in the Philippines. In the Philippines four principal agricultural research institutes, women comprised 53% of researchers with an MS or Ph.D. The objective was to understand the circumstances for women in the workplace and the facilitating and constraining factors which affect women's roles. The study revealed that there is low turnover at the workplace and that women scientists continue in their work after bearing children. This is attributed in part to a number of supporting elements of the research organization including a policy for

extended maternity leave, flexible work schedules, and an emphasis on team work. External support comes from extended families and domestic help.

Both men and women reported collegial relationships with professionals of the opposite sex where relationships are equal; some men still have difficulty with women in positions of power. The researchers state that cultural stereotypes of men's dominant and women's subordinate roles still affect relationships. One area of concern was the still unequal attainment of women to the higher levels of decision-making and management. Overall the study shows that the integration of women professionals in the workplace has proceeded smoothly, but that there are still areas requiring management attention, particularly the carryover of stereotypes from domestic relations into the workplace and further monitoring and incentives for women to attain higher levels professionally. (ISNAR and PCARRD. 1993. Women scientists and managers in agricultural research in the Philippines)

ISNAR Ms. Anna Wuyts-Fivawo and Dr. Edwin Brush

134 Development Studies and Scientist. Under the ISNAR program for linkages of researchers with farmer organizations, Ms. Wuyts and Dr. Brush are engaged in two gender-related activities. With colleagues at the Eastern and Southern Africa Management Institute (ESAMI) they are designing a five day workshop on gender, technology development and transfer, and agricultural research management aimed at middle level practitioners. ESAMI provides training in agricultural research management for the SADC countries. a second project, in the planning stages, is to conduct a workshop for scientists who have already been doing gender-related work. This would provide an opportunity for them to speak directly from field experiences as to different methods and options for reliable and efficient use of gender analysis.

12. Networks

IITA Dr. Georg Weber and Dr. Hank Mutsaers [both left IITA in 6/93]

135 Agronomists. IITA is the convening member of the Collaborative Maize-Based Cropping Systems Project (COMBS). This project fit leguminous species into maize based cropping systems. To do this they constructed a set of biophysical and socioeconomic diagnostic questions to describe farming systems and farmer preferred characteristics. The descriptors resulting from the diagnosis could then 'matched' for 'best bets' to leguminous species specified in cropping system models. They introduced a set of questions relating to gender in a workshop held in 1993. The CGIAR Gender program contributed a chapter with gender related questions to the COMBS diagnostic handbook. (Collaborative Group on Maize

Based Systems Research. Improvement of soil fertility and weed suppression through legume based technologies. Research Guide #48. IITA)

IRRI 136 The Women in Rice Farming Systems Program

IRRI has exercised leadership in using gender analysis and in looking at possibilities for technology development that are directed specifically to increase the productivity of farm women. From the mid-1980s, most gender-related research was done in collaboration with scientists from national programs connected through the Women in Rice Farming Systems Network (WIRFS). The WIRFS program continued until September 1995 as part of the Asian Rice Farming Systems Network. Collaborative research which incorporates a gender perspective also continues, and research is being done now within IRRI. Many of the studies described below were done under the WIRFS program.

As part of the WIRFS program, IRRI scientists continue to collaborate with national scientists in including gender analysis in their study of specific farming systems corresponding to IRRI's ecosystems. Such studies indicate the appropriate farmer collaborators for specific areas of research and particular opportunities for improving the productivity of women farmers. Recently, studies were undertaken at an irrigated site in Vietnam, a partially irrigated site in the Philippines (including the rice micromill below), a rainfed site in Nepal, and an upland site in the Philippines. In Nepal, one activity was to train women in multipurpose tree production. As in the Guimba case below, the women organized themselves in a group to grow seedlings and this has become the basis for a women's association. At the upland Philippines site, ten families were visited weekly for a year to assess current labor-use patterns in order to determine the acceptability of sustainable agricultural production technologies. Labor is fairly exchangeable between the sexes. The study found that women's wage income from off-farm in factories was higher than that of men; men's productivity in on-farm operations was greater than women. So that women could continue wage jobs, men continued in on-farm production and increased their share of household chores.

Between 1992 and 1995 a number of technologies were tested and evaluated by WIRFS and IRRI researchers:

Knowledge based technologies:
- rice see management
- soybean storage
- integrated pest management.

Agricultural engineering
ultralight transplanter
- drumseeder

- weeders
- panicle thresher huller
- flour rice mill
- rice dehuller
- rice husk store
- micro rice mill

Small livestock production:
homegrown feeds for swine
upgrading local breeds of poultry
Improved crop varieties:
IR65 glutinous rice
improved rice varieties
evaluated by men and women
Introduction of multipurpose trees
Introduction of green animal fodder for household production.

Between 1992 and 1995, over 100 papers were produced under the WIRFs umbrella. Between 1991 and 1995, 65 individuals attended gender analysis training at IRRI and 108 in-country training programs. Gender was included as a topic in 8 other training courses for 190 participants. Five national and two international workshops on gender and agricultural research reached 310 participants. The story of the WIRFS program has been published as a CGIAR gender program case study. (IRRI. 1994. Program Report for 1993; and D. Mowbray. 1995. From the field to lab and back: The women in rice farming systems network. CGIAR. Copies are available by writing to Hilary Sims Feldstein c/o The CGIAR Secretariat.)

13. Priority Setting and Program Reviews

13.1 Priority Setting

ICRISAT Gender in Priority Setting

137. In developing the 1994-1998 Medium Term Plan, ICRISAT used four criteria--efficiency, equity, internationality, and sustainability--as key parameters against which likely impact was assessed. The institute adopted a gender-related indicator as one of two factors used for the equity indicator, that is the extent of female illiteracy taken from the UNDP Human Development Report (1992). ICRISAT considers this a good proxy for general welfare. The other factor is the traditional headcount index of the poor which has serious drawbacks because of measurement problems. Because of the association of education of women with higher incomes and better child care and nutrition, the female illiteracy rate appears to be a good indicator of overall human welfare. (Personal Communication from Don Byth, Associate Director General)

IRRI Gender in priority setting.

138 IRRI has used a congruence model for setting priorities and allocating resources among the rice ecosystems. Average years of schooling of female population relative to the male population was used as proxy measure of gender disparity. At IRRI, a sensitivity analysis on using the "gender gap proxy" shows that rainfed lowland and upland rice ecosystems benefitted from this indicator. (Personal communication from Dr. K. Fischer, Deputy Director General for Research.)

13.2 Project Proposals and Review

CIP Project proposals and review

139 Every research project at CIP annually prepares a sub-project proforma reviewing current status, recent results, and plans for next year. Under the category of "expected outcomes" are three subcategories--general, environmental, and gender. CIP respondents to a recent survey of researchers incorporating a gender perspective in their research stated they found the question useful and an effective device for encouraging scientist attention and reflection.

ICRISAT Project Proposals and Review

140 In 1991, ICRISAT included in its information monitoring system, questions for each project on the implication for sustainability and gender of the expected results. In some cases, there are specific and thoughtful responses; in others, the replies are cursory. In 1996, some of these statements will be used as working hypotheses for impact and adoption studies to be conducted jointly by technical scientists, social scientists, and NARS scientists.

ANNEX A

Entry Numbers for Research Projects That Fit the Cross-cutting Categories of Gender-related Research

a. **Methodologies development**
1, 28, 64, 86, 87, 90, 106, 107, 116

B. **Adoption studies and impact assessment**
4, 9, 35, 52, 57, 60, 61, 63, 77, 94, 95, 102, 110

C. **Characterization and diagnostic studies**
18, 19, 20, 23, 25, 26, 27, 28, 37, 45, 48, 51, 52, 53, 54, 59, 69, 70, 73, 79, 80, 81, 82, 83, 84, 100, 111, 112, 113, 123, 127, 136

D. **On-farm research**
11, 15, 23, 42, 71, 72, 74, 87, 109

E. **Postharvest processing and management and marketing studies**
10, 15, 28, 29,30, 36, 38, 46, 47, 62, 67

F. **Literature reviews and special studies**
16, 50, 56, 108, 109, 110, 111, 112, 113, 123, 127

G. **Women-specific technologies or women-focused studies**
15, 16, 17, 31, 34, 46, 47, 56, 72, 73, 91, 109, 111, 112, 113, 114, 97, 99, 103, 122, 123, 127, 129, 132, 133, 136.

ANNEX B.1

Matrix of Center entries and CGIAR Categories.

CENTER	1	2	3	4	5	6
CIAT	1, 2, 3 ,4	15, 16, 17, 18, 19, 20, 21				78, 79
CIFOR				64, 65, 66, 67, 68		80,81
CIMMYT	5,	22, 23, 24, 25				
CIP	6	26, 27, 28, 29, 30				
ICARDA	7, 8, 9, 10	31, 32, 33, 34	56			82
ICLARM					77	
ICRAF				69, 70, 71, 72, 73, 74, 75, 76		
ICRISAT	11	35				
IFPRI						
IIMI						
IITA	12, 13	36, 37, 38, 39, 40, 41, 42, 43, 44, 45				
ILRI			57, 58, 59, 60, 61, 62, 63			
IPGRI						
IRRI		46, 47, 48, 49, 50, 51				
ISNAR						
WARDA	15	52, 53, 54, 55				

CENTER	7	8	9	10	11	12	13
CIAT	83		116	123			
CIFOR							
CIMMYT	84			125			
CIP	85, 86, 87		117	126			139
ICARDA	88			127			
ICLARM				128			
ICRAF			118				
ICRISAT		93	119				137, 140
IFPRI		94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107		129, 130			
IIMI		108, 109, 110, 111, 112, 113, 114		131			
IITA			120			135	
ILRI		115					
IPGRI	89, 90, 91		121	132			
IRRI						136	138
ISNAR					133, 134		
WARDA							

CGIAR Categories of activities

1. Germplasm Enhancement & Breeding
2. Crops& Cropping Systems
3. Livestock and Livestock Systems
4. Trees and Tree Systems
5. Fish and Aquatic Systems
6. Protecting the Environment
7. Saving Biodiversity
8. Improving Policy
9. Training
10. Documentation, Publications, Information Dissemination
11. Organization/Management Counselling
12. Networks
13.* Priority Setting and Project Proposals and Review

* Addition to CGIAR list

ANNEX B.2 Matrix of Center Entries and Cross-cutting categories.

CENTER	a	B	C	D	E	F	G
CIAT	1, 116	4	2, 16, 18, 19, 20, 21, 123	15	15,	16, 123	15, 16, 123
CIFOR	64		68, 79, 80, 81, 82, 83,		67		
CIMMYT	84, 87		23, 25, 84	23			
CIP	86, 87		26, 27, 28,	87	28, 29, 30		
ICARDA		9	127		10	56, 127	31, 34, 56, 127
ICLARM	128	77					
ICRAF			69, 70, 73	71, 72, 74			72, 73
ICRISAT	93	35		11			
IFPRI	106, 107	94, 95, 102,	100				97, 99, 103, 129
IIMI		110	111, 112, 113	109		108, 109, 110,	109, 111, 112, 113, 114
IITA			37, 45, 48, 62	42	36, 38,		
ILRI		57, 60, 61, 63	115		62		
IPGRI	90		91				91, 132
IRRI			51, 136		46, 47,		136
ISNAR							133
WARDA		52	52, 54, 55				122

Cross-Cutting Categories

A. Methodologies development
B. Adoption and impact studies
C. Characterization and diagnostic studies
D. On-farm research
E Postharvest processing and management and marketing studies
F. Literature reviews and special studies
G. Women-specific technologies or women-focused studies.

ANNEX C

Index of Center Researchers doing Gender Related Research

ANNEX D

CGIAR Center Addresses

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