WOMEN'S ROLES IN IRRIGATED AGRICULTURAL PRODUCTION SYSTEMS DURING THE 1985 YALA SEASON

PARAKRAMA SAMUDRA SCHEME AND GIRITALE SCHEME

POLONNARUWA DISTRICT

SRI LANKA

(Project No. 383 - 0057)

Prepared by:

M. Kathleen Kilkelly

For:

USAID/COLOMBO, Sri Lanka

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EXECUTIVE SUMMARY

A component relating specifically to women was included as part of a larger, interdisciplinary baseline study of Parakrama Samudra and Giritale irrigation systems. A series of three field surveys, consisting of interviews with 98 PSS women and 50 Giritale women, were conducted during the 1985 Yala season on the two irrigation schemes. The overall objectives of this component were to identify the interaction of women with various aspects of the irrigated agricultural production systems.

Due to the increasing age of the PSS and Giritale settlement schemes, a large number of second or third generation descendants, as well as the original settler family, were present. Therefore, the interviews included both wives and widows, daughters, and daughters-in-law. In fact, a significant number of widowed households were noted in the sample. Households headed by widowed women composed 26% of the PSS sample and 32% of the Giritale sample. These households have special needs and unique problems in farm management, and require representation in farmer organizations.

Women were found to be active participants in the irrigated agricultural production system. Approximately half of the women surveyed were physically engaged in agricultural work on a regular basis. Women were involved in the majority of agricultural tasks, except for strenuous land preparation activities and agrochemical use. Activities with the highest level of female participation included transplanting, weeding, and harvesting. A significant level of female involvement in water management activities was also reported. The female participation in water management activities ranged from 11-16% for paddy, and up to 33% for other field crops.

In addition to work in their own fields, 34% of the PSS women and 48% of the Giritale women were also involved in various off-farm activities. The majority of this work was either associated with agriculture, or community projects such as road, bund, and channel repair and construction.

Women were also actively involved in decision-making and management of the farm operation. Farming decisions were shared between male and female family members in a significant (20-45%) number of households. In approximately 10% of the PSS households and 20% of the Giritale households, women (primarily widows) reported that they alone dealt with the majority of farming decisions. Participation of females was highest when decisions regarding loans or pawning for cultivation needs were made. In households involved in this activity, 20-24% of the decisions were made exclusively by women alone. This was probably a result of the colony age, and the significant number of widows inheriting legal title to the land.

Although 80% of the surveyed women expressed interest in pecific agricultural subjects, the major sources of agricultural information reported by women were traditional experience and informal means (the husband and neighbors).

Presently, the Agricultural Extension Service appears unable to serve the needs and desires of farm women. However, a significant number of women mentioned the mass media, such as radio and newpapers, as a souce of agricultural information. The relatively high level of female education noted in the survey, combined with the accessibility of radio and newpapers might be a means of extending agricultural information to women.

Most households obtained domestic water from wells located on the highland. Thirty percent of the PSS women and 52% of the Giritale women repo ted difficulties with their wells during the Yala season. Based on observations, the highland wells appeared to be dependant upon recharge from the irrigation system. Because the relationship between the irrigation system and the highland wells is presently unclear, additional hydrological research is needed. Low water levels, or dry wells in the latter part of Yala (when irrigation issues are limited) often required that women seek alternative sources of domestic water.

During the Yala season, home gardening is limited due to insufficient rainfall, and the absence of a water delivery system to the highland. Less than a third of the PSS and Giritale households were gardening on the highland. These small plots were cared for by both men and women, and were generally limited to home consumption, with only occasional sale. On the other hand, when highland were located favorably, irrigation water was often tapped for paddy, chili, tobacco, or vegetable cultivation. This extensive cultivation, primarily for sales rather than home consumption, was noted on 30% of the PSS and 20% of the Giritale highland allotments. The irrigation of these highland undoubtedly has a significant impact on the present ability of the system to deliver water to the fields.

Although difficult to quantify, one of the most often cited sources of supplemental income for the household included the sale of fruits, vegetables, coconuts, or crops cultivated on the highland. The cultivation of chili or tobacco on the highland could make a substantial contribution to the household income. Additionally, women indicated that the sale of small quantities of vegetables, fruits, and coconuts was their primary means of obtaining personal cash. Although the highland allotment represents a tremendous potential for production, present constraints such as water supply, poor soils, animal damage, and increasing fragmentation are limiting factors. Research to evaluate alternative methods for increasing the productivity of the highland is needed.

Women rarely participated in Kanna (pre-cultivation) meetings. Only five women reported attendance at the 1985 Yala meeting, and six attended the 1985-86 Maha meeting.

The majority of women claimed that water user associations did not exist in their area, or were unaware of these groups. Present methods of solving water-related problems have resulted in limited satisfaction. As a result, 65% of the women surveyed expressed the need for a group with authority to solve irrigation problems. In addition, the majority of women stated that they would be willing to join water user associations.

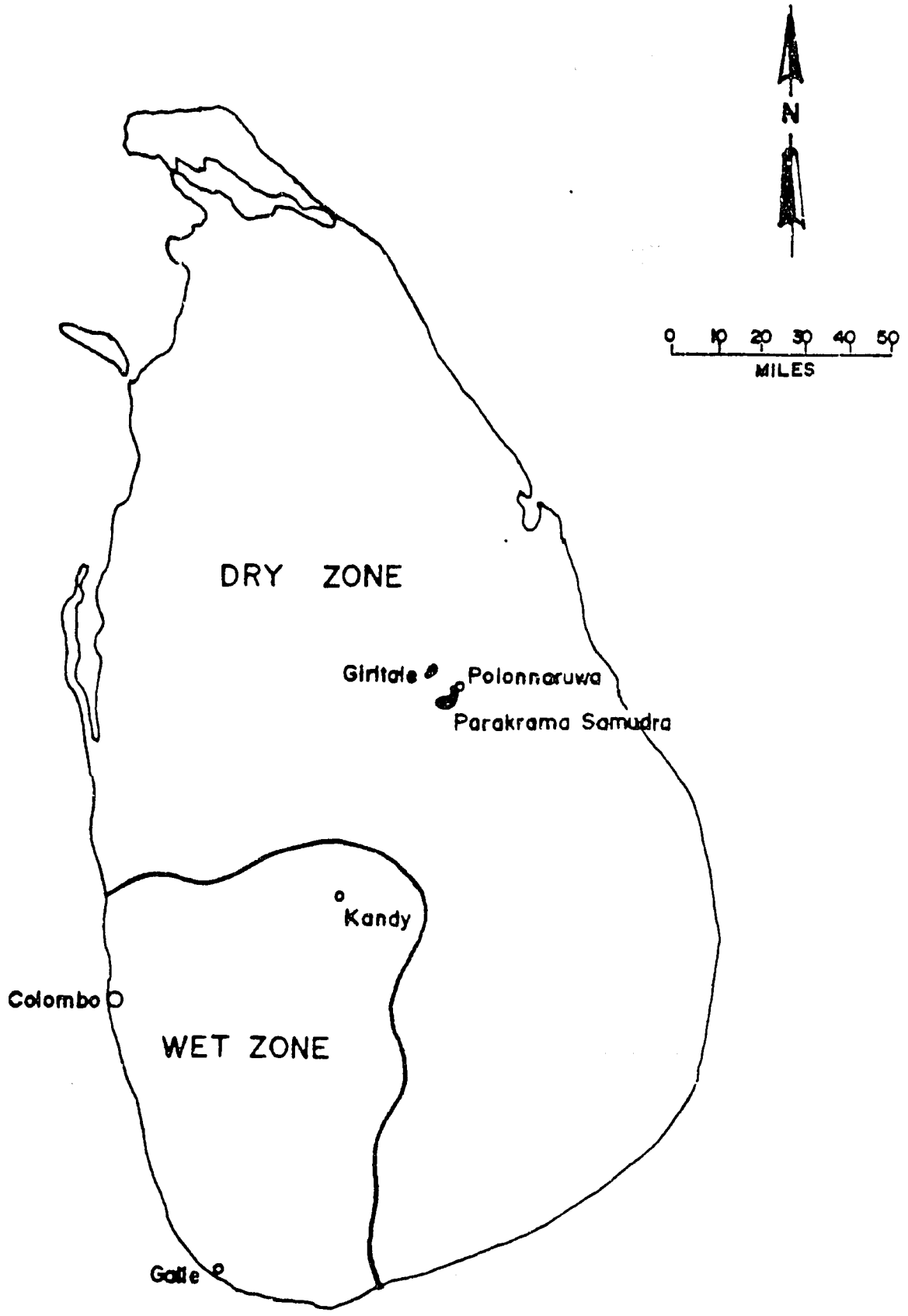

Figure 1. Parakrama Samudra and Giritale Irrigation Schemes.

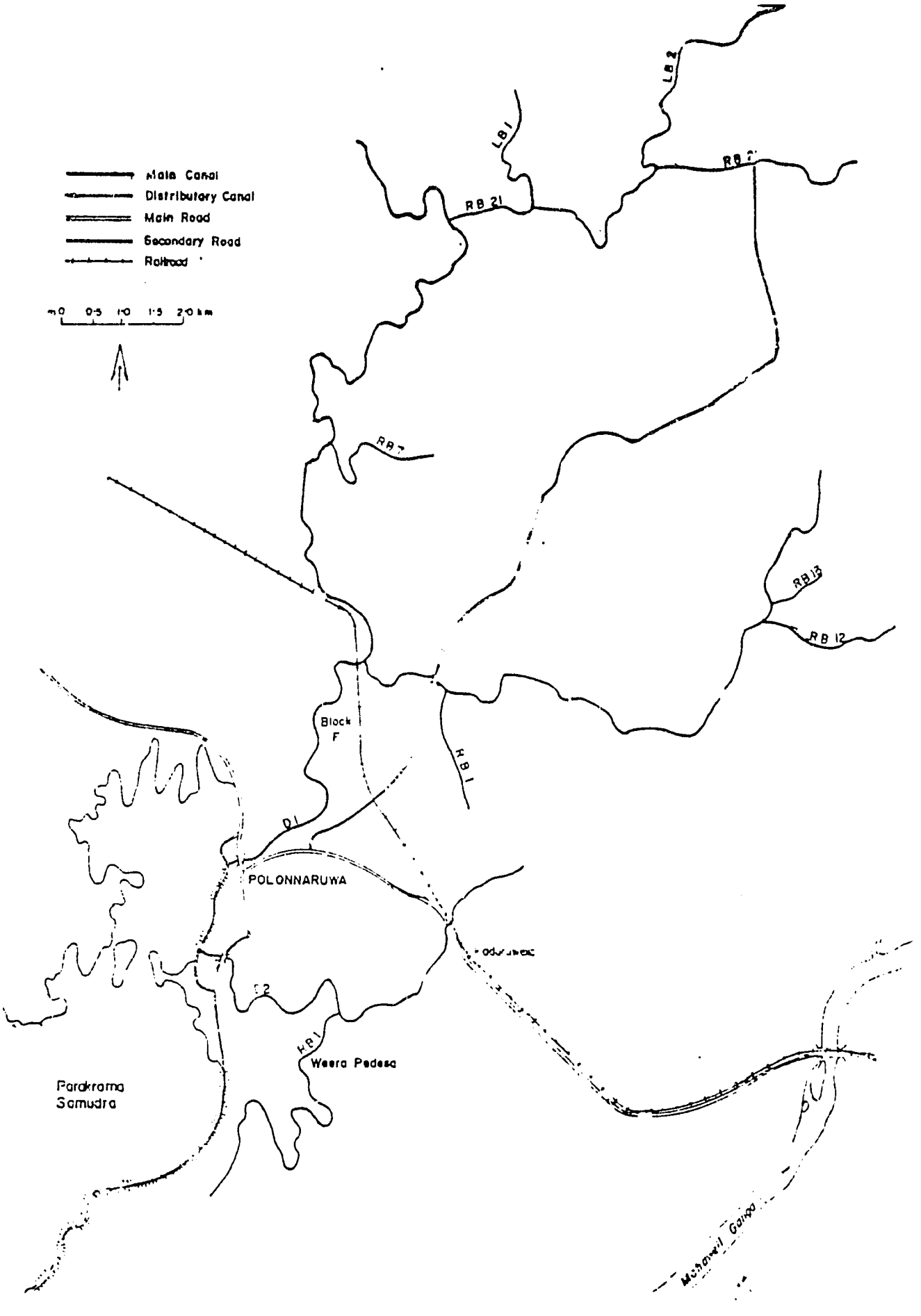

Figure 2. Field Sites on Parakrama Samudra Irrigation Scheme.

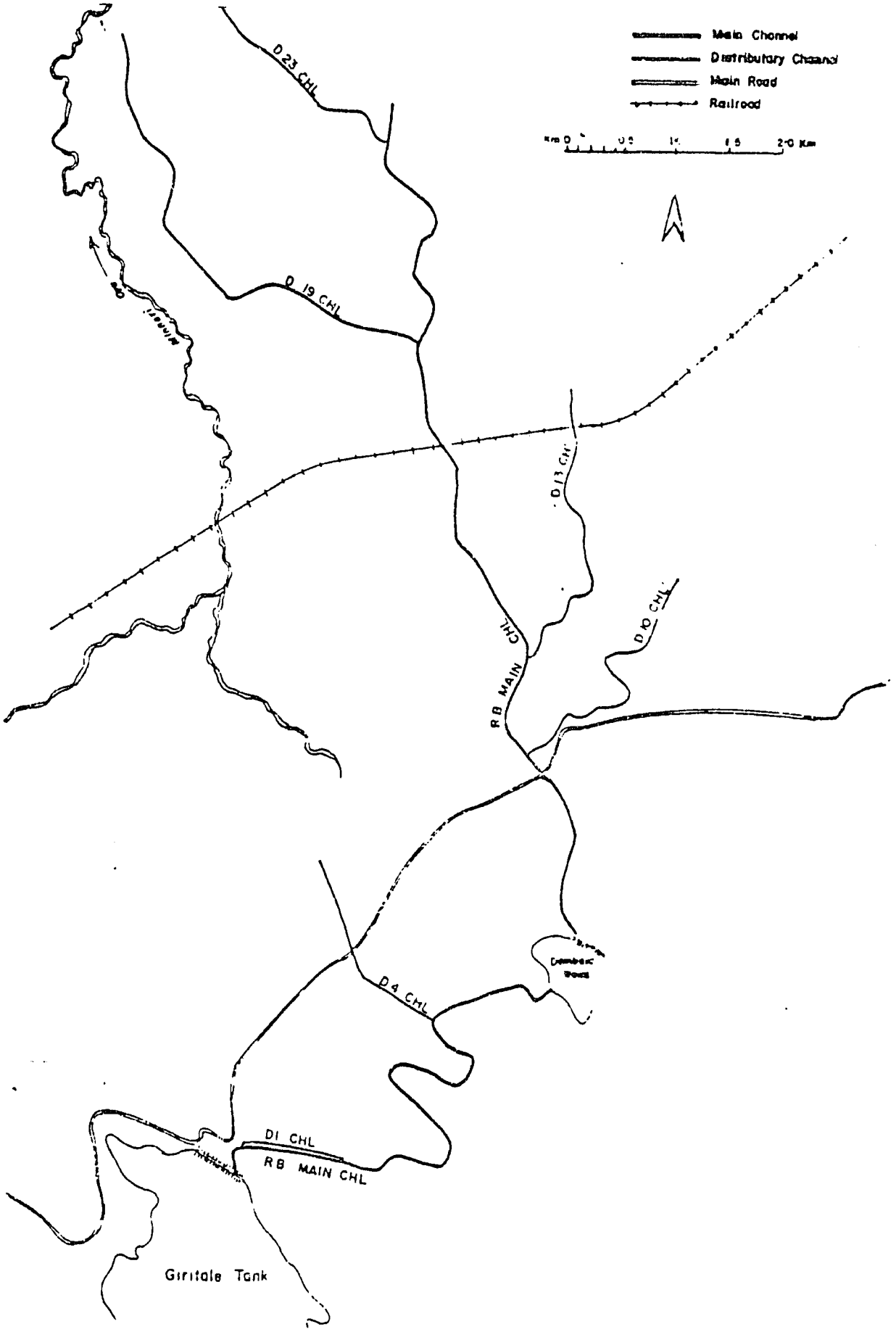

Figure 3. Field Sites on Giritale Irrigation Scheme.

PURPOSE AND OBJECTIVES OF THE STUDY

In Sri Lanka, both the national government and international donors such as USAID are increasingly promoting the development and improvement of irrigation systems, large and small alike, as a means for increasing agricultural production. Paralleling this is a greater awareness of the importance of women's roles in agricultural production. Despite the noticeably greater attention given to farm women in recent development projects, understanding women's roles in irrigated agriculture as well as their interaction with the irrigation system is, at present, minimal.

The study on women's roles in irrigated agricultural systems was conducted as part of the Diagnostic Analysis (DA) Project. The DA Project is an interdisciplinary research effort funded by the USAID/Colombo Mission with support from the Water Management Synthesis II Project (WMSIIP). The WMSIIP is an extensive project sponsored by the USAID, through the Consortium for International Development - a group of eleven western U.S. universities. The DA Project seeks to gather background information concerning selected irrigation systems, identify and prioritize constraints, and discuss various approaches for solving irrigation-related problems. Fundamental to the DA Project, is the philosophy that irrigation problems are not confined to one single discipline, such as engineering or agronomy; but rather, involve a wide range of issues including social and economic aspects as well. In order to investigate both the physical and socio-economic aspects of an irrigation system, interdisciplinary teams work together using a process of diagnostic analysis. Initially the DA Project included engineering, agronomy, sociology, and economics. Through funding from the USAID/Colombo Mission, a component relating specifically to women was added to the study.

This component, titled: Women's Roles in Irrigated Agricultural Production Systems, is referred to as the Women in Development (WID) component. Because the WID component is an integral part of the DA Project, it shares many of the overall objectives of the Diagnostic Analysis, including:

1. Training of local personnel (especially women) in the use of diagnostic analysis techniques and interdisciplinary teamwork.

2. Developing a set of evaluation procedures and methodologies (specifically related to WID) for investigating and monitoring irrigation schemes.

3. Contributing background information (relating to women's roles) on irrigation systems in the Polonnaruwa District.

4. Providing future rehabilitation and improvement projects with information (concerning women) to increase sensitivity to issues and methods of improving the total well-being of the farm household.

While all of the different coaponents of the Diagnostic Analysis Project hold the same general objectives, each also contributes in specific ways to these objectives. More expressly, the study relating to women's roles in irrigated agricultural production systems seeks to gather specific information concerning:

1. Sex-disaggregated data relating to:
   -- agricultural activities associated with irrigated crop production.
   -- decision-making concerning the farming operation.
   -- household activities, especially domestic water and firewood procurement.
   -- decision-making associated with the household.

2. Sources and access to agricultural information for women.

3. Perceptions of women concerning agricultural and field irrigation problems.

4. The role of women in highland productivity:
   -- home gardening
   -- permanent tree crops
   -- livestock

5. The income and expenditure patterns and preferences of the household, including the role of women in family resource management.

6. The participation of women in community organizations as well as informal groups, with particular attention to water user associations and Kanna meetings.

7. The settlement experience of women, levels of satisfaction and personal views.

The study makes an effort to cover many broad topics of interest, and is basically exploratory in nature. It is not expected that all questions relating to women's roles in irrigated agriculture will be conclusively answered, but that important and significant areas will be identified. Information from the study is aimed towards providing the Diagnostic Analysis Project with an additional dimension to understanding the complex operation and interaction of the irrigated agricultural system and the farm household.

Sample Selection

The Parakrama Samudra and Giritale irrigation schemes were chosen by the Diagnostic Analysis Project for investigation during the 1985 Yala season.

Because the overall theme of the DA Project deals with the identification of constraints on the irrigation system, the site selections of head, middle, and tail locations on the irrigation system were chosen by the Engineering and Agronomy components to represent expected hydrological differences. In addition to these sites chosen for field measurements, the Economics, Sociology and WID surveyed other areas with above average availability of water, and areas with restricted or limited availability of water. While hydrological locations may also exhibit significant social and economic differences, overall, correlation may be less important for the WID component. Only data specifically relating to water or irrigation constraints were analyzed by hydrological location.

Table 1. Field Site Locations for the 1985 Yala Study.

	Parakrama Samudra		Giritale	
	Distributary	households	Distributary	households
Head:	Block F of D1	19	D1	8
	RB1 of D1 East	10	D4	14
	Weera Pedesa	9		
Middle:	RB7 of D1 North	19	D10	5
			D13	5
Tail:	LB1 of RB21 of D1 North	21	D19	10
	LB2 of RB21 of D1 North	10	D23	8
	RB12 of D1 East	5		
	RB13 of D1 East	5		
Total:		98		50

The sample was composed of farm households with field allotments from both head and tail field channels of the above distributary channels. Weera Pedesa is somewhat of an exception, not originally designed as part of the PSS settement but later included. This site varies from the other settlement holdings because irrigation water is obtained directly from another main canal without field channels. The land holding size also varies from the standard allotment of the PSS settlement, as this area was encroached.

The actual number of households in the PSS and Giritale schemes is not presently known. However, based on the original number of allottees, adjusted for the second generation, approximately a 2-3% sample of the extimated population was obtained. Efforts were made to include only those households

engaged in cultivation during the 1985 Yala season. However, due to the complexity of land tenure arrangements and restrictions imposed by the hydrological selection of the sample, some non-cultivating households (with fields selected for measurements) were also surveyed. Within each household, the selection of the female respondant was based somewhat on availability, accessibility, and the subjective opinion of the field investigator as to which family female could best provide the type of information required.

Field Investigators

Most of the seven WID investigators were previous participants in the Diagnostic Analysis Workshop conducted July 23 - August 17, 1984 on PSS. Therefore, they were familiar with Diagnostic Analysis concepts, interdisciplinary team work, and specific WID objectives and techniques. Those investigators who had not attended the workshop were exposed to this information during an interdisciplinary reconnaissance survey conducted January 3 - 16, 1985 on other sites of PSS and the Kaudulla irrigation scheme. In addition, all field investigators of the WID, Economics and Sociology components attended a workshop on interviewing techniques August 10 - 11, 1985. The close contact between WID and other team members also increased awareness and improved interviewing skills of all components.

The WID field investigators consisted of a variety of locally experienced personnel. Included were: an Agricultural Instructor and an Agricultural Economic Assistant from the Agriculture Department; a Colonization Officer from the Kachcheri; and Assistant Rural Development Officer from the Ministry of Rural Development; a former Polonnaruwa Community Development Officer; and two recent University Graduates from the area. All of these personnel lived and worked in the area, providing a great deal of local expertise.

Questionnaires

The construction of the WID questionnaires were based largely on the two Diagnostic Analysis Workshops previously conducted in Sri Lanka (1983-System H of the Mahaweli and 1984-Parakrama Samudra). Individuals from the Women's Bureau and the Agrarian Research and Training Institute also contributed information and suggestions. Various offices and agencies in the Polonnaruwa District such as the Ministry of Rural Development, Agriculture Department and the Kachcheri provided valuable information used in the construction of the questionnaires. Most importantly, the WID field investigators discussed the topics and actually formulated the questions by group participation. The translation of the questionnaires from English to Sinhala was conducted by the entire WID group together. Field investigators were able to practice the administration of the questionnaire by "role-playing" within the group, and a pre-test was conducted before each survey. The questionnaires contained a mixture of both open-ended, discussional questions and specified response questions. All questionnaires were administered in Sinhala.

The content of the questionnaires included:

I Demographic Information - age, education, family composition, etc.

II Farm System - activities, decision-making, sources of information, access to extension, and perceived problems.

III Household System - activities, decision-making, sources of information, needs and desires, and perceived problems. livestock, home gardening, water and firewood procurement, and health and nutrition.

IV Income and Expenditures - patterns and preferences, family resource management, purchasing power.

V Community Participation - formal organizations, informal groups, water user associations and Kanna meetings.

VI Settlement Experience - satisfaction, suggestions for improvement.

Surveys

Three surveys were conducted during the 1985 Yala season. During these surveys, different questionnaires were administered to the same households on the two irrigation schemes. While the general format was similar, each questionnaire also dealt with other specific topics.

The first survey was conducted June 11 - 23, 1985 on PSS and July 9 - 13, 1985 on the Giritale scheme. This questionnaire was designed to collect background demographic information and field activities especially related to the land preparation and plant establishment phase of the cultivation season. The content of this questionnaire was largely exploratory in nature and formed the basis of questions for the remaining two surveys.

The second questionnaire was administered August 14 - 21, 1985 on PSS and August 21 - 25, 1985 on the Giritale scheme. This survey concentrated on the care of the maturing crop (weeding, applying fertilizer, insecticides, pesticides, and water management). An attempt was also made to include a section relating to health and nutrition. Many of the questions in the second survey emerged from the first questionnaire. In addition, some questions were also repeated or reworded as checks and attempts to resolve difficult or complex questions.

The third survey was conducted October 8 - 14, 1985 on PSS and October 15 - 19, 1985 on the Giritale scheme. This questionnaire specifically addressed the harvesting and marketing of the crop, with questions relating to the management and plans for cash received from the harvest. Again, further detail and clarification of the previous topics occurred.

It was previously observed by the WID investigators that close cooperation with both the Economics and Sociology components was both beneficial and necessary. The three components generally conducted all surveys at the same time and traveled together, alternating partners for simultaneous interviews of households. This was particularly important for the WID investigator, as the male family members tended to intrude on the WID interview if they were not kept preoccupied by either the Economics or Sociology investigator. During the three surveys, both the WID field supervisor and the WID coordinator conducted observations of interviews. Questions or problems were resolved by immediate attention and group discussion.

Data Analysis

Field investigators were issued tabulation forms and coding sheets. An effort was made to either provide a period for data coding and tabulation at the end of each survey day, or every few days during the survey. Coded data were verified from the original questionnaire by the WID field supervisor and the WID coordinator.

The coded data were entered on a COMPAQ microcomputer for analysis by MICROSTAT - a statistical analysis software program. In addition, some of the open-ended discussion questions found to be incompatible with computer analysis were hand tabulated. Basically, a one-way frequency analysis was used for most variables, and the arithmetic mean for other variables. Cross-tabulations of two different variables were performed for a few selected variables.

FINDINGS OF THE STUDY

The findings of the study on women's roles in irrigated agricultural systems are presented for each of the two irrigation schemes investigated, Parakrama Samudra (PSS) and Giritale. While both of these irrigation systems are settlement schemes, and similar in many ways, it was felt that a number of important differences (age of the colony, land allotment sizes, off-farm sector development, etc.) existed and precluded the combined analysis of the data. In some cases, where similarities in analysis were observed, discussion is relevant to both PSS and Giritale. Where differences appeared, some explanation was usually attempted, but by no means considered conclusive. For the most part, many of the similarities and differences will be identified and evaluated when analysis of the information collected by the other components of the Diagnostic Analysis Project is completed.

Because the study was conducted as an integral part of the Diagnostic Analysis Project, it also relies on information collected by the other components. While each component is able to provide an analysis of its own data, the overall understanding of the irrigated agricultural system is vastly enhanced when information from the various components is successfully integrated. Presently, however, the data analysis of all components is incomplete and the incorporation of findings from the other components into this report is limited. Perhaps, the interdisciplinary report planned by the Diagnostic Analysis Project will expand the findings of the study.

DEMOGRAPHIC INFORMATION

Table 2. Background Information on PSS and Giritale Schemes. *

	Parakrama S.	Giritale
Date of settlement	1942	1956
Designed command (acres)	19,000	4,500
Present command (acres)	25,000	7,500
Lowland allotment (acres)	5	3
Highland allotment (acres)	3	1
Original no. allottees	4,000	1,500

* Present data is inadequate, therefore most figures are based on available estimates.

The Parakrama Samudra scheme is the largest irrigation project in the Polonnaruwa District. Beginning in 1942, after the expansion and rehabilitation of the ancient tank, approximately 4,000 allottees were settled on this scheme. The original design was to serve approximately 19,000 acres of paddy land, but, primarily due to encroachment, is now estimated at around 25,000 acres. The settler was allotted 5 acres of lowland for paddy cultivation, and 3 acres of highland for the homestead. Approximately 20% of the original PSS allottees were female.

The Giritale scheme is the smallest of the four irrigation projects chosen for study in the Polonnaruwa District. The scheme is divided into an "older" and "newer" settlement area. Because the older area is relatively small in extent, the newer, larger settlement areas was chosen for study. This area was settled around 1956 with 1,500 allottees on 4,500 acres of irrigated paddy land, now estimated at 7,500 acres. All of the Giritale sample field sites selected included paddy allotments of three acres, while the highland comprised one acre (the sizes of other holdings varied with the date of settlement). There is one main channel from the tank, with a few branching channels that serve small areas. All of the sample sites were selected from distributary channels of the major channel.

A total of 98 farm women from PSS were interviewed, 38 from the head, 19 from the middle, and 41 from the tail of the irrigation system. All of the PSS sample sites were located on distributaries of the D1 main canal except for Weera Pedesa (D2 main canal). A total of 50 farm women from Giritale were interviewed, 22 from the head, 10 from the middle, and 18 from the tail of the irrigation system.

Throughout this report, the term "wife" is used to indicate the original relationship within the nuclear family which settled the area. The status of the woman within the family is an important variable when such topics as work responsibilities and decision-making are examined.

Table 3. Family Position of Respondents.
(PSS n=98) (Giritale n=50)

Status	PSS	Giritale
wives	38%	44%
widows	14%	20%
daughters	10%	12%
daughters-in-law	36%	22%
granddaughters	2%	2%

Although only 14 widows on PSS were interviewed, there were actually 26 widowed households included (27% of the sample). On Giritale, 16 widowed households were included (32% of the sample). In these additional households, either the daughter or the daughter-in-law was interviewed.

Table 4. Marital Status, Origin, and Length of Residence of PSS Respondents. (n=98)

Marital Status		Origin		Residency		
married	82%	1st generation settler	43%	< 1	yr	1%
unmarried	3%	2nd generation settler	38%	1-5	yrs	12%
widowed	15%	3rd generation settler	2%	6-10	yrs	10%
		Outside settlement	17%	11-20	yrs	21%
				21-30	yrs	17%
				31-40	yrs	38%

In addition to the designated widows, one daughter-in law (PSS) and one daughter (Giritale) were also widowed. All of the unmarried women were daughters residing in the home of their parents.

Table 5. Marital Status, Origin, and Length of Residence of Giritale Respondents. (n=50)

Marital Status		Origin		Residency		
married	70%	1st generation settler	62%	< 1	yr	
unmarried	8%	2nd generation settler	36%	1-5	yrs	12%
widowed	22%	3rd generation settler	2%	6-10	yrs	2%
				11-20	yrs	18%
				21-30	yrs	58%
				31-40	yrs	10%

While most of the women were original settlers or descendants of settlers, 17% of the PSS sample were "pioneers"; either purchasers, encroachers, or women from outside the settlement who had married into the colony. Although none of the Giritale women identified themselves as such, there were probably a number in this category. Some of these women had taken up residence at the time of colony establishment (such as the entire Weera Pedesa area on PSS) and were long-standing members of the community.

Table 6. District of Origin of PSS Respondents. (n=98)

Up-Country:	%	South/Coastal:	%	Dry Zone:	%
Kandy	26	Gampaha	7	Polonnaruwa	17
Nuwara Eliya	11	Galle	5	Kurunagala	11
Kegalle	5	Colombo	3	Total	28
Matale	4	Negombo	3		
Badulla	1	Matara	2		
Total	47	Kalutara	2		
		Batticaloa	1		
		Total	23		

The selection of settlers for PSS and Giritale was primarily from the Up-Country Wet Zones, however a number of other localities were also represented. Interestingly, some of the descendants of original settlers have now begun to identify the settlement in Polonnaruwa District as their origin. Although Purana villages were incorporated into the PSS settlement, they were limited primarily to areas close to the tank on the D2 main channel, and the D3 main channel, neither of which was included in this survey. Purana villages were also included in the Giritale resettlement scheme but none of the women interviewed identified themselves as such.

Table 7. District of Origin of Giritale Respondents. (n=50)

Up-Country:	%	South/Coastal:	%	Dry Zone:	%
Kandy	20	Puttalum	2	Polonnaruwa	32
Kegalle	18	Galle	2	Kurunagala	6
Matale	18	Colombo	2	Total	38
Total	56	Total	6		

The age of the women ranged from 17 to 78 years, with an overall average of 44 years of age. The age of the settlement schemes is reflected in the fairly well distributed ages of women, with fewer very young or very old women found on Giritale, compared to PSS.

Table 8. Age, Education, and Family Size of Respondents. (PSS n=98) (Giritale n=50).

Age	PSS	G	Education	PSS	G	Family Size		PSS	G
	---%	---		---%	---			---%	--
<= 20 yrs	3		none	16	36	1-2	members	3	4
21-30 yrs	23	16	1-5 yrs	38	22	3-5	members	36	34
31-40 yrs	27	30	6-10 yrs	26	28	6-8	members	40	52
41-50 yrs	18	24	(GCE) O'	13	10	9-11	members	12	10
51-60 yrs	16	24	(GCE) A'	7	4	12-18	members	6	
> 60 yrs	12	6							

The educational level of the women interviewed ranged from none to the (GCE) Advanced Level. On PSS the overall average was six years of formal schooling, compared to four years for

Giritale women. Approximately 20% of the PSS sample had received more than 10 years of schooling, a fairly high level for a rural area. On the other hand, the number of Giritale women with no formal education was twice that of the PSS women.

Family size ranged from 2 to 18 family members occupying the same house, with an average of 6.6 members for PSS and 6.1 members for Giritale. Most households shared a common hearth where meals were cooked and eaten together, but some of the larger extended families maintained several separate cooking and eating facilities.

Although the PSS settlement is predominantly Sinhalese Buddhist, three Christian and one Muslim family were included in the sample. All families interviewed on Giritale were Sinhalese Buddhist, with no ethnic or religious minorities included.

Table 9. Residency Location of Families Related to Respondents. (PSS n=98) (Giritale n=50).

On Highland	PSS	G	In Fields/Reservation	PSS	G
	---%	---		---%	---
none	12	8	none	66	84
1 family	36	50	1 family	30	12
2 families	36	36	2 families	2	4
3 families	13	6	3 + families	2	
5 + families	3				

The increasing pressure on the settlement scheme is apparent when the number of highlands occupied by more than one family are noted, and still other families are residing in the fields. The age of the settlement and the questions and legalities regarding the inheritence of the original allotment are a predominant problem. Due to land fragmentation among descendants, some farm families retain as little as 1/2 acre. Further complications include a variety of tenural arrangements such as leasing, mortgaging, and sharecropping (ande and wee_ porunduwa) among family as well as outsiders. It was actually rare to find the original field allotment and highland still intact, and managed by a single family. However, one interesting case involved a PSS household with seven adult sons. Realizing the difficulty and futility of dividing their lands, the family retained a traditional form of land sharing (tattumaru). With this practice the cultivation of the entire five acres was rotated each season to one son, with the original parent settlers receiving a portion of the crop from each cultivation. Unfortunately the majority of fragmentation problems were not so easily resolved, many of which end up as conflicts and disputes in court. Although land fragmentation on Giritale is also an increasing problem, the severity is somewhat less than the PSS settlement with far fewer families sharing the highland or fields. However, as the age of the Giritale colony approaches the current age of the PSS settlement, it is expected that similar problems will arise.

Of the 98 PSS households investigated, 14 were not cultivating during the 1985 Yala season. Four of the 50 Giritale households surveyed were also not cultivating for the 1985 Yala season. All of the cultivating households were engaged in paddy cultivation, with some cultivating small, additional extents (generally 1/4 to 1/2 acre) of other field crops such as chili, tobacco, or vegetables.

Overall, a number of complex, intricate land tenure arrangements were noted. Some cultivators were simultaneously involved in leasing-out, leasing-in, subdividing lands among relations, sharecropping, purchasing, or selling portions of the original allotment. Some attempt was originally made to clarify the tenural status of the respondant. However, the combination of intricacies and hesitency to reveal existing tenure relationships made this impractical. Although widely ignored, legal restrictions do exist on the leasing, mortgaging, transfer, and subdivision of the original allotment. Perhaps the Agronomy, Economics, and Sociology components may present a better picture of the land tenure situation in the PSS and Giritale schemes.

Agricultural Activities

This section of the report deals only with the agricultural activities performed by PSS and Giritale women in either their own or other's fields during the 1985 Yala season. Agricultural work such as caring for small extents of vegetables growing on the field bunds or borders, home gardening, and highland crop production are addressed in a separate section of this report dealing with domestic production.

It should also be noted that differences between Yala (dry season) and Maha (wet season) may exist which effect the extent of female labor for various activities. Increased acreage cultivated, increased transplanting compared to broadcasting, and decreased crop diversity are commonly associated with Maha production. These changes may affect not only the total amount of female labor, but also the distribution between family, local, or outside-contract female labor.

Table 10. The Age and Agricultural Activity of PSS Respondents. (n=98)

	<=20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	>50 yrs	Total %
not active					4	4%
mainly housework		14	12	4	15	46%
house/fieldwork	3	9	14	13	7	47%
wage labor only					2	2%
business				1		1%
Total %	3%	23%	27%	18%	29%	100%

Table 11. The Age and Agricultural Activity of Giritale Respondents. (n=50)

	<=20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	>50 yrs	Total %
not active						
mainly housework		4	9	4	9	52%
house/fieldwork		3	6	7	6	44%
wage labor only				1		2%
business/job		1			2	6%
Total %		16%	30%	24%	34%	104% *

* Two women indicated both business and house/field work.

Approximately half of the PSS and Giritale women reported that they were engaged in some type of agricultural work on a regular basis. These women either worked on their own family farm, off-farm as casual laborers, participated in exchange labor (attam), or various combinations of these activities. Women indicating that they were mainly preoccupied in the household, said that they also occasionally assisted in the fields during the peak labor periods of transplanting and harvesting.

Two PSS widows, both over 50 years, because of mortgaged lands, were dependant upon casual wage labor. In addition, a woman from the Weera Pedesa area of PSS was primarily involved in managing a bakery and boutique business. One Giritale woman was dependant upon casual wage labor due to mortgaged fields. Two other Giritale women were engaged in a business (in additior to performing house and field work), while another woman was primarily occupied as a teacher.

Although the average age of women interviewed was 44 years, almost one third of the PSS and Giritale sample was over 50 years old, which should affect participation in field activities. A surprisingly high proportion of these women on Giritale were still active in field work. In addition, 27% of the PSS sample was composed of women under 30 years, many of which had young children, limiting their work outside the home. Three young PSS women in this category were either unmarried or childless, thereby increasing their participation in fieldwork. Middle aged women (30-50 yrs) represented 45% of the PSS sample and 54% of the Giritale sample. These women were generally engaged in both housework and fieldwork. Some of the responsibility for housework and child care in these households had been assumed by older children, freeing these women for agricultural work.

Paddy Production:

The most common agricultural activities performed by women in paddy cultivation during the 1985 Yala season included: germinating seed, transplanting seedlings, manual weeding, and harvesting. In addition, women also took on much of the responsibility for supervising hired laborers, even when not actually performing agricultural work themselves.

Although women generally did not participate in land preparation activities requiring great physical strength, a significant number of women did assist in the control of water issues for flooding the fields prior to plowing.

The germination of paddy seed by women is traditionally considered good luck, consequently even elderly women no longer physically active in field work performed this activity. Experience and skill are necessary to insure that the seed had reached the appropriate moisture content, and the fragile germinated seed must be carefully disentangled to prevent damage before sowing.

Approximately 50% of all cultivating households transplanted some acreage of paddy, although the majority of acreage is generally broadcast for the Yala season. As expected, the transplanting of paddy seedlings was a primary focus of female agricultural participation.

On PSS, 45% of the female transplanting labor consisted of hired labor without family participation, family and hired females together accounted for 33% of the female labor, and family labor alone provided the balance (22%). On Giritale, however, a more equal distribution of transplanting labor was observed. Female family members on Giritale appeared to provide more of the transplanting labor compared to PSS, where hired labor was more common. This may be due to a number of variables including the smaller size of field allotments and the overall lower economic status of Giritale households compared to PSS.

Table 12. Distribution of Female Paddy Transplanting Labor. (PSS n=46) (Giritale n=25)

Source	PSS	Giritale
family	22%	32%
family/local	13%	28%
family/contract	9%	4%
family/local/contract	11%	4%
local	13%	24%
contract	26%	8%
local/contract	6%	

Table 13. Gender Division of Paddy Cultivation Activities on PSS for 1985 Yala.

Activity	(n=)	females only	males/ females	males only	Total female (Rel %)*
Land Preparation:					
flooding fields	(84)	1	13	70	17
plowing/breaking clods	(84)	0	1	83	1
puddling	(84)	0	1	83	1
preparing seedbeds	(84)	0	2	82	2
making/plastering bunds	(84)	0	1	83	1
broadcast basal fertz.	(84)	0	2	82	2
Seeding:					
select/purchase seed	(86)	8	9	69	20
germinate seed	(85)	19	10	56	34
broadcast seed	(78)	0	1	77	1
scare birds	(73)	3	9	61	16
Nursery Care:					
watering	(46)	0	4	42	9
fertilizing	(46)	0	1	45	2
apply weedc./insectc.	(46)	0	0	46	0
Transplanting:					
pluck seedlings	(46)	43	1	2	96
plant seedlings	(46)	43	3	0	100
Crop Care:					
manual weeding	(76)	64	10	2	97
fertilizing	(86)	2	9	75	13
apply weedc/insectc.	(78)	0	5	73	6
Water Management:					
clean field channel	(85)	1	8	76	11
control turn-out	(83)	1	8	74	11
repair bunds	(86)	0	10	76	12
liyadda water control	(85)	0	10	74	12
Harvesting:					
cutting	(82)	2	38	42	49
gathering	(82)	3	41	38	54
tieing bundles	(82)	3	40	39	52
carrying bundles	(82)	2	30	50	39
threshing	(82)	0	10	72	12
winnowing	(82)	1	18	63	22
cleaning grain	(81)	1	20	60	25
drying grain	(73)	1	15	57	21
bagging grain	(82)	1	17	64	20
transport bags	(82)	1	15	66	18
Management:					
hiring laborers	(76)	7	9	60	21
suprv. laborers	(74)	4	31	39	47

* The (Rel %) of Total female participation is the sum of all cases of females participating in the activity, divided by the number of households performing the activity X 100. For example: of the 76 households engaged in manual weeding, women were involved in 74 (97%) of the cases.

Table 14. Gender Division of Paddy Cultivation Activities on Giritale for 1985 Yala.

Activity	(n=)	females only	males/ females	males only	Total female (Rel %)*
Land Preparation:					
flooding fields	(46)	1	5	40	13
plowing/breaking clods	(46)	0	2	44	4
puddling	(46)	0	2	44	4
preparing seedbeds	(46)	0	2	44	4
making/plastering bunds	(46)	0	0	46	0
broadcast basal fertz.	(46)	0	1	45	2
Seeding:					
select/purchase seed	(45)	1	4	40	11
germinate seed	(46)	18	1	27	41
broadcast seed	(46)	1	0	45	2
scare birds	(35)	3	11	21	40
Nursery Care:					
watering	(28)	0	4	24	14
fertilizing	(28)	0	0	28	0
apply weedc./insectc.	(28)	0	0	28	0
Transplanting:					
pluck seedlings	(28)	21	3	4	86
plant seedlings	(28)	22	3	3	89
Crop Care:					
manual weeding	(43)	35	8	0	100
fertilizing	(45)	1	3	41	9
apply weedc/insectc.	(38)	0	1	37	3
Water Management:					
clean field channel	(40)	2	3	38	12
control turn-out	(38)	2	3	33	13
repair bunds	(45)	2	5	38	15
liyadda water control	(43)	2	5	36	16
Harvesting:					
cutting	(46)	0	26	20	56
gathering	(46)	0	28	18	61
tieing bundles	(46)	1	30	15	67
carrying bundles	(46)	0	21	25	46
threshing	(46)	0	11	35	24
winnowing	(46)	1	17	28	39
cleaning grain	(46)	0	14	32	30
drying grain	(34)	1	11	22	35
bagging grain	(46)	0	14	32	30
transport bags	(45)	0	11	34	24
Management:					
hiring laborers	(36)	4	6	26	28
suprv. laborers	(36)	4	11	21	42

* The (Rel %) of Total female participation is the sum of all cases of females participating in the activity, divided by the number of households performing the activity X 100. For example: of the 43 households engaged in manual weeding, women were involved in all cases (100%).

Manual weeding of paddy was predominately done either by women alone or in a few cases with males. The most common arrangement being either family females alone or family and local females together. Again, the prominance of family female labor over hired female labor on Giritale may be related to smaller field allotments or overall lower economic status. On the other hand, agrochemical use was dominated by males.

Table 15. Distribution of Female Paddy Weeding Labor. (PSS n=74) (Giritale n=43)

Source	PSS	Giritale
family	37%	37%
family/local	27%	42%
family/contract	5%	2%
family/local/contract	1%	
local	24%	16%
contract	5%	2%
local/contract		

Although activities associated with water management were generally performed by men, a group of eight to ten women from PSS and two to five women from Giritale were engaged in these activities. This represents a female involvement of about 11-16%, a significant figure for water management activities. These were extremely diverse groups; consisting of three widows five wives, two daughters, and five daughters-in-law.

The labor intensive activities associated with harvesting paddy generally required all available labor, both male and female. In addition to family and local labor, contract labor teams composed mainly of males from outside the area are employed. This practice of procuring teams of men (rather than women) for harvesting seems to be an unusual characteristic of the Polonnaruwa District. Most of the activities such as cutting the paddy, gathering the cut paddy, tieing into bundles and carrying the bundles to the threshing floor were performed by both men and women. The majority of female labor was supplied by family and local females working together for these activities. However, the participation of women was less for threshing, winnowing, cleaning, and bagging of grain. Perhaps this may be a result of the use of mechanized equipment such as tractors and blower fans for paddy post-harvest activities.

Table 16. Distribution of Female Paddy Harvesting Labor. (PSS n=43) (Giritale n=29)

Source	PSS	Giritale
family	23%	52%
family/local	35%	31%
family/contract	5%	
family/local/contract	2%	
local	28%	7%
contract	2%	10%
local/contract	5%	

Transplanting Crews:

During the transplanting phase of the cultivation season, teams of women - primarily from the Up-Country Wet Zone, arrive in the Polonnaruwa area. Informal, conversational interviews were conducted by the WID field supervisor and the WID coordinator with five of these teams. These women are generally paid about Rs. 25/day and provided with shelter, meals, tea, soap, hair oil, beedies, etc. during their stay. Many of these teams are from the original village of the PSS settlers, and may even be relations with whom contact has been maintained. Some households reported that they employ the same crews year after year and have built up a good rapport assuring them of the necessary labor supply. Other households expressed dissatisfaction with the work of outside contract transplanters, and claimed that the quality of their work was poor and required careful supervision. These teams are generally managed by a leader/procurer who was usually hesitant to disclose financial arrangements with the cultivator in the presence of the crew.

Other Field Crop Production:

In addition to paddy, 20 households on PSS (20%) and 17 households on Giritale (34%) were also cultivating other field crops. Chili was the most popular secondary crop, with tobacco and vegetable crops such as green gram, cowpea, onions, and assorted other vegetables also noted.

Although, women were generally not involved in the preparation of seedbeds, they did assist in the application of basal fertilizer before seeding or transplanting. Planting seed was generally done by both women and men working together, the men generally making the furrow or dibble hole, and the women dropping and covering the seed.

Males were involved to a much greater extent than women in the transplanting of other field crop seedlings compared to paddy transplanting. Although the reasons are not clear, this may occur because the cultivation of crops such as chili has only been recently introduced into the settlement scheme and traditional cultural practices are not as developed as in the case of paddy. Also, the extent of chili cultivation is generally limited to about 1/4 to 1/2 acre for individual households, decreasing the need for a large, labor force. On the other hand, the investment in chili cultivation is considerably more than for paddy, and a higher degree of technical knowledge is also required, which may indirectly decrease the participation of women.

Manual weeding was performed primarily by men and women together. Activities such as fertilizer incorporation and earth mounding are often done simultaneously with weeding, therefore the involvement of women is significant for these activities. Even though proportionately more women were engaged in applying weedicides and insecticides in other field crop production than in paddy production, their overall involvement remained low.

Table 17. Gender Division of Other Field Crop Cultivation Activities on PSS for 1985 Yala.

Activity	(n=)	females only	males/ females	males only	Total female (Rel %) *
Land Preparation:					
forming seedbeds	(18)	0	0	18	0
broadcast basal fertz.	(10)	0	5	5	50
Seeding:					
select/purchase seed	(15)	0	0	15	0
planting seed	(13)	0	11	2	85
scare birds	(3)	1	1	1	67
Nursery Care:					
watering	(9)	0	3	6	33
fertilizing	(9)	1	2	6	33
apply weedc./insectc.	(10)	0	2	8	20
Transplanting:					
pluck seedlings	(11)	1	4	6	45
plant seedlings	(14)	1	7	6	57
Crop Care:					
manual weeding	(20)	6	10	4	80
fertilizing	(20)	2	8	10	48
mounding earth	(20)	4	8	8	57
apply weedc./insectc.	(17)	1	2	14	19
cut tobacco flowers	(6)	1	3	2	66
Water Management:					
irrigating	(19)	2	4	13	32
Harvesting:					
plucking	(19)	6	10	3	84
threshing	(5)	0	3	2	60
cleaning/grading	(15)	3	9	3	80
drying	(17)	5	9	3	82
bagging	(15)	2	11	2	87
Management:					
hiring laborers	(6)	0	2	4	33
suprv. laborers	(6)	2	3	1	83

* The (Rel %) of the Total female participation is the sum of all cases of females participating in the activity, divided by the number of households performing the activity X 100.

NOTE - Some households cultivated crops that were planted by seed, not requiring transplanting - green gram, squashes.
- Some households cultivated crops that were seeded in nurseries and later transplanted - chili, onion.
- Some households purchased seedlings ready for transplanting - tobacco, chili.

Table 18. Gender Division of Other Field Crop Cultivation Activities on Giritale for 1985 Yala.

Activity	(n=)	females only	males/ females	males only	Total female (Rel %)*
Land Preparation:					
forming seedbeds	(17)	0	0	17	0
broadcast basal fertz.	(14)	0	3	11	21
Seeding:					
select/purchase seed	(16)	1	7	8	50
planting seed	(13)	1	5	7	46
scare birds	(2)	0	1	1	50
Nursery Care:					
watering	(4)	0	1	3	25
fertilizing	(4)	1	1	2	50
apply weedc./insectc.	(5)	0	0	5	0
Transplanting:					
pluck seedlings	(13)	3	4	6	54
plant seedlings	(13)	1	5	7	46
Crop Care:					
manual weeding	(14)	6	7	1	93
fertilizing	(14)	1	9	4	71
mounding earth	(15)	3	6	6	60
apply weedc./insectc.	(14)	0	0	14	0
cut tobacco flowers	(2)	0	2	0	100
Water Management:					
irrigating	(12)	1	3	8	33
Harvesting:					
plucking	(15)	8	6	1	93
threshing	(7)	2	4	1	86
cleaning/grading	(11)	4	6	1	91
drying	(15)	4	9	2	87
bagging	(14)	2	10	2	86
Management:					
hiring laborers	(5)	1	2	2	60
suprv. laborers	(5)	1	2	2	60

* The (Rel %) of Total female participation is the sum of all cases of females participating in the activity, divided by the number of households performing the activity X 100.

NOTE - Some households cultivated crops that were planted by seed, not requiring transplanting - green gram, squashes.
- Some households cultivated crops that were seeded in nurseries and later transplanted - chili, onion.
- Some households purchased seedlings ready for transplanting - tobacco, chili.

It may be that because the care and maintenance of these crops is considerably more labor intensive than paddy, there are simply more women involved in some of these activities as part of the larger work force required.

Approximately five to six pluckings generally occur over a two to three month period for chili. This activity was primarily performed by both men and women together, but remained one of the activities with the highest female involvement.

Post-harvest care of the crop such as cleaning, grading, drying and bagging, appeared to involve significant contributions from women. In fact, participation of women was greater than for the same post-harvest activities associated with paddy cultivation. Most likely this is because the post-harvest care of other field crops is done by hand, compared to paddy, where tractors and blower fans are used. The process of spreading chili to dry and slowly moving from shade to direct sunlight takes approximately a week under ideal conditions. This process necessitates a good deal of attention, provided mainly by family females.

Although most of the households relied heavily on family labor, others employed local labor throughout the season. Males most often assumed the responsibility of hiring the laborers on PSS, but women were actually involved to a greater extent than men in the supervision of the laborers. This may reflect the level of participation by women themselves in the labor intensive activities such as weeding and plucking of mature tobacco leaves and chili pods, which occur throughout the season. On Giritale, women appeared to have equal involvement with men for both hiring and supervising laborers.

Off-farm Activities

Women from PSS and Giritale were involved in a wide range of activities besides work in the family fields. Overall, 34% of the PSS women and 48% of the Giritale women reported that they were engaged in off-farm work. In addition to agricultural work, some women also joined either casual labor crew or shramadana groups for non-agricultural activities.

While the majority of women involved in agricultural work limited their activities to their own family fields, eight women from the PSS sample and thirteen Giritale women were engaged in agricultural wage labor. Most of these women also worked their own fields as well, but two PSS women (widows) and one Giritale woman were dependant on wage labor because their fields were mortgaged. The most common agricultural activities were associated with paddy transplanting, weeding of paddy and chili, and harvesting of paddy and chili. Four women from both PSS and Giritale were involved in non-agricultural wage labor. Most of these activities consisted of road, bund, and channel construction or repair.

Table 19. Off-farm Activities of Respondents. *
(PSS n=98) (Giritale n=50)

Type of Activity	PSS	Giritale
Casual wage labor:	(10)	(17)
Non-Agricultural	4	4
Agricultural	8	13
transplanting	6	7
weeding	4	5
harvesting	2	8
Attam:	(19)	(12)
Non-Agricultural	6	
Agricultural	13	12
transplanting	13	8
weeding	4	5
harvesting	1	2
Shramadana:	(21)	(17)
Non-Agricultural	19	17
Agricultural	2	1
Chena	1	1
No off-farm activities	65	26

* Multiple responses are possible.

Another form of off-farm agricultural work includes attam (exchange labor). This form of labor is an important method of obtaining labor, primarily for the intensive transplanting period. However, some attam is also associated with weeding and harvesting. Thirteen PSS and 12 Giritale women indicated that they participated in this form of off-farm work with neighbors in order to reduce the need for hired labor.

A number of PSS and Giritale women joined shramadana (volunteer) groups engaged in community activities such as road, bund, channel, and building construction or repair. Although shramadana is not generally associated with agriculture (but more with community projects) three women participated in agricultural work through this activity. All of these women were involved in a Kantha Samithi paddy cultivation project.

In addition, although it may be considered an extension of the family fields, two woman were involved in chena (shifting, rainfed) cultivation.

Agricultural Decision-making

While the physical participation of women in agriculture can more easily be observed and documented, the aspect to which women are involved in the management of the farm is more difficult to ascertain. A variety of questions were asked about women's roles in agricultural decision-making during the 1985 Yala surveys, but the actual process or steps involved would require a more in-depth study. The degree to which women were active or passive participants in discussions, as well as women's knowledge of the process was not clearly established.

While women reported their own involvement in these matters, to female investigators, similar questions posed by the male Sociology investigators to the male household member may differ significantly.

While some of the decisions regarding the operation of the farm were dominated by males, a relatively high degree of female participation was reported. In nearly half of the households, women were participants in the decision-making for a number of important agricultural matters. A large number of households reported joint decision-making between husband and wife (or other male and female family members). Women from these households indicated that they shared discussion and responsibility with their husbands or sons on a number of agricultural subjects.

Women were most likely to be involved in decisions such as:

- determining the acreage to lease-out or cultivate,
- obtaining loans/pawning articles for cultivation needs,
- hiring labor for weeding,
- determining the frequency of weeding and time of harvest,
- determining the marketing of the crop, and
- management of the cash income from the harvest.

In those households taking loans or pawning, women alone were responsible for this decision in 20% of the PSS households and 24% of the Giritale households. These women consisted of thirteen widows, seven wives, two daughters-in-law, and one daughter.

The participation of women in decisions concerning the leasing or mortgaging of fields, and obtaining loans may be related to the fact that many women were probably the technical title holder or legally recognized as the household head. Approximately 20% of the original PSS allottees were female, with this number expected to increase due to the colony age (and the associated increase in widows of male allottees, who automatically become the title holder). While either sons or sons-in-law may be responsible for the management of the farm, legally the woman may retain the recognized authority to obtain loans, etc. Also contributing to women's involvement is the fact that often, when cash is required for cultivation needs, one of the pawned items may be the women's gold jewelery. Needless to say, women would actively participate in this decision.

Women did not generally participate in decisions regarding the need and use of agrochemicals, or in agricultural problem solving. Even in households where the majority of agricultural decisions were shared by husband and wife, when subjects of a technical nature were encountered, the participation of the wife was noticeably reduced. It was interesting to note that when women were not physically involved in such activities, neither did they participate in decisions. Instead, the activities most often performed by women were also those where they appeared to be more involved in the decision-making process (such as weeding

and harvesting). Another aspect may relate to the fact that some of the decisions that are regularly required during cultivation necessitate a level of technical knowledge that women may presently lack.

Table 20. Gender Division of Agricultural Decisions by PSS Households.

Subject	(n=)	females only	males/females husband & wife	males/females misc. comb.	males only	Total female Rel %*
acreage to cultv	(91)	7	24	7	53	42
acreage to give-out	(69)	5	20	9	35	49
crop selection	(91)	8	17	6	60	34
loans/pawn for cultv	(71)	14	20	4	33	54
seed purchase/select	(90)	9	20	7	54	40
hire labor/equip for land prep	(85)	8	15	8	54	36
hire labor-weeding	(82)	5	29	18	30	64
timing of weeding	(79)	9	20	18	32	60
fertz need	(86)	3	18	10	55	36
fertz use	(86)	2	16	9	59	31
insectc/weedc need	(83)	2	15	8	58	30
insectc/weedc use	(82)	2	15	7	58	29
solve agric problems	(91)	8	19	2	62	32
when to harvest	(86)	5	25	20	36	58
sell/keep harvest	(77)	6	26	6	41	48
where/who to market	(79)	7	17	8	47	41
use of harvest cash	(79)	9	24	11	35	56

* The Rel % of Total female participation is the sum of all cases of females participating in the activity, divided by the number of households performing the activity X 100.

Widowed women generally relied upon either sons or sons-in-law to assist them with farming decisions. However; four widows, one wife, and a married daughter appeared to be solely responsible for all phases of the farm management on PSS and Giritale.

With the increasing age of the original settlers, more parents were also turning to the second generation, both for physical and decisional management. Characteristically, the agricultural decisions were turned over to the adult children, with the parents retaining some level of participation in decision-making.

Table 21. Gender Division of Agricultural Decisions by Giritale Households.

Subject	(n=)	females only	males/females husband & wife	males/females misc. comb.	males only	Total female Rel %*
acreage to cultv	(47)	5	9	11	22	53
acreage to give-out	(35)	4	8	7	16	54
crop selection	(46)	7	5	9	25	48
loans/pawn for cultv	(37)	9	7	6	15	59
seed purchase/select	(46)	5	6	7	28	39
hire labor/equip for land prep	(45)	3	7	8	27	40
hire labor-weeding	(38)	2	8	6	22	42
timing of weeding	(42)	5	6	13	18	57
fertz need	(43)	2	3	8	30	30
fertz use	(43)	2	3	5	33	23
insectc/weedc need	(38)	2	3	3	30	21
insectc/weedc use	(38)	1	3	3	31	18
solve agric problems	(47)	5	6	11	25	47
when to harvest	(43)	3	8	13	19	56
sell/keep harvest	(45)	6	4	3	32	29
where/who to market	(45)	9	3	3	30	33
use of harvest cash	(47)	9	6	6	26	42

* The Rel % of Total female participation is the sum of all cases of females participating in the activity, divided by the number of households performing the activity X 100.

Agricultural Information

Overwhelmingly, women indicated that their main source of agricultural knowledge came from traditional experiences. Most women reported that what they knew of agriculture was gained through their mothers, sisters, or other family members. In fact, this type of "informal" agricultural knowledge (including the husband, neighbors, and other farmers) surpassed any other sources of agricultural information for PSS and Giritale women.

The second most common category of agricultural information was the mass media. Radio programs such as Sarabumi, agricultural quiz shows, and advertisements were often cited as well as newspaper articles. However, only a few women found that this type of information was often useful to them.

In the first field survey, a surprisingly large number of women indicated contact with the Agricultural Extension Services staff such as the KVS officers. This information was followed-up in the second and third field surveys. Apparently, the wording in the first questionnaire was sufficiently ambiguous that women perceived this to be contact between the "household" (ultimately male family members) and the extension staff. Not until the third field survey was this question

Table 24. Agricultural Information Sources of PSS Respondants. (n=98)

Source	Primary	Others *	Use of Information often	sometimes	never
Traditional	59	23			
Husband	16	39			
Neighbors	4	37			
Radio	2	42	7	33	4
Newspapers		31			
Television		11			
Pamphlets		5			
Agric Ext staff	13	18	8	21	2
Training classes		5		2	1
Private traders		2			
Contact farmers		2			

* Only one response was possible for the Primary source, but Others is the sum of multiple responses.

resolved. It now appears that approximately 24% of PSS and Giritale women, themselves, actually had contact with the extension staff. Even this is probably an inflated figure due to the fact that some women believed the Vel Vidane and Colonization Officer to be agricultural extension staff.

Table 23. Agricultural Information Sources of Giritale Respondants. (n=50)

Source	Primary	Others *	Use of Information often	sometimes	never
Traditional	30	13			
Husband	11	18			
Neighbors	2	15			
Radio	1	18	1	12	6
Newspapers		6			
Television		3			
Pamphlets		1			
Agric Ext staff	4	17	2	17	2
Training classes		3	1	2	
Private traders		2			
Contact farmers		1			

* Only one response was possible for the Primary source, but Others is the sum of multiple responses.

When women were asked if they were seeking agricultural information, 77% of PSS women and 80% of Giritale women responded affirmatively. While the magnitude of this response may be partially the result of a "courtesy response", women did name specific subjects of interest. Far more than any other item, information on high yielding varieties of paddy was requested. Secondly, information of pests, diseases, and their control was cited, while interest in animal husbandry and

subsidiary crops followed. Of those women not expressing an interest in agricultural information the majority responded that they simply had no time to pursue such subjects, while the rest generally claimed that they did not require agricultural information.

Table 24. Agricultural Topics of Interest to Respondants. * (PSS n=98) (Giritale n=50)

Type of Information	PSS	Giritale
High Yielding Varieties	72	33
Pests/diseases	18	11
Animal husbandry	10	1
Subsidiary crops	9	7
Water management	8	
Agrochemicals	4	2
Not seeking info	21	10

* Multiple responses are possible.

Agricultural Constraints

In the first field survey 92-94% of the women from PSS and Giritale reported specific agricultural problems for the 1985 Yala season. When these women were asked to describe a single "most serious" agricultural problem, the majority of PSS women responded that insufficient water and delays in receiving scheduled water issues were serious problems. Closely following this response, women reported that agricultural inputs were also a serious constraint. Giritale women, however, cited economic difficulties associated with agricultural inputs as the major constraint to crop production. Not until after these problems (associated with pest, disease, and weed control) was insufficient water mentioned as an agricultural problem. Overall, on both PSS and Giritale, the problems associated with pests, diseases and weeds, agricultural input costs, and water delivery were identified most often by women as agricultural constraints.

Although the questionnaire specified that only problems encountered in the 1985 Yala season were to be considered, either the field investigators or the respondents may have included problems occurring during the Maha season. This may partially explain the substantial number of responses concerning flooding or poor drainage.

While most of these constraints were mainly physical in nature, many primarily economic problems were frequently cited. In fact, women identified the source of many of the physical problems as economic difficulties. Women reported that the increased cost of production inputs (including pest and weed control) combined with the low guaranteed price of paddy, resulted in economic problems for the household. When questioned about the agricultural loan programs, women responded that they did not apply due to previous defaults, crop insurance

requirements, or absence of land titles. Consequently, most cash for agricultural inputs was obtained either through private businessmen and boutiques (often at usurious interest rates) or pawning of articles such as jewelery, radios, and bicycles.

Table 25. Agricultural Constraints of Respondents in the First Field Survey. (PSS n=98) (Giritale n=50)

	Primary		Others *	
Type of Constraint	PSS	Giritale	PSS	Giritale
flooding/drainage	13	7	21	4
insufficient water	16	6	8	1
scheduling/rotation	8	2	7	1
fragmentation/disputes	3	2	6	6
unlevel fields	1	1	5	1
distance to highland	2		1	2
animal damage			5	1
sandy soil/rocks	7		11	2
high clay soil			5	1
infertile soil	3		4	
saline soil		2	3	
diseases	2	2	25	12
insects/pests	8	4	24	14
weeds	6	2	28	16
low yields	2	2	14	7
labor availb/cost	1	2	17	3
input availb/cost	15	9	29	14
marketing			2	
loans/credit	2	1	6	4
leased/mortgaged	1	4	3	1
no response	9	3		

* Only one response was possible for the Primary problem, but Others is the sum of multiple responses.

There appeared to be little difference between hydrological location and water-related problems reported by women on PSS. Those households in the head locations reported as many problems associated with water excesses or deficiencies as the households in the tail. On Giritale, however, a higher proportion of households located in the tail of the irrigation system reported water-related problems (especially deficiencies of water), compared to the head (with primarily flooding problems).

Table 26. The Distribution of Primary Water-related Problems on PSS by Hydrological Position. (n=98)

	Head (38)	Middle (19)	Tail (41)	Total (98)
Water-related Problems	rel%	rel%	rel%	rel%
flooding/poor drainage	6 (16)		7 (17)	13 (13)
insufficient amount	4 (11)	4 (21)	8 (20)	16 (16)
scheduling/rotations	5 (13)	3 (16)		8 (8)
Total	15 (40)	7 (37)	15 (37)	37 (37)

Table 27. The Distribution of Primary Water-related Problems on Giritale by Hydrological Position. (n=50)

Water-related Problems	Head (22)	rel%	Middle (10)	rel%	Tail (18)	rel%	Total (50)	rel%
flooding/poor drainage	5	(23)	1	(10)	1	(6)	7	(14)
insufficient amount	1	(5)			5	(28)	6	(12)
scheduling/rotations			1	(10)	1	(6)	2	(4)
Total	6	(28)	2	(20)	7	(40)	15	(30)

Surveys conducted later in the season explored the methods used by households in solving particular agricultural problems. Approximately half of the households on PSS and Giritale were attempting to resolve agricultural problems cited in the third field survey. The male members of the family were almost exclusively involved in seeking a solution. There were four exceptions noted; two cases involved widows, and in two other cases both male and female family members sought help together.

Table 28. PSS Households Seeking Solutions to Agricultural Problems Reported in the Third Field Survey. (n=44)

	Head	Middle	Tail	Total
Households Seeking Solutions:	14	9	21	44
Type of Problem:				
water-related	7	5	13	25
pest/disease	6		6	12
weeds	3		2	5
poor germination	1			1
poor yields	1			1
conflict/dispute	1	2	2	5
economic	1	2	1	4
cattle trespass			2	2
Family Member Involved:				
male only	13	9	17	39
female only	1			1
male/female			1	1
Outside Contact:				
Vel Vidane	4	5	8	17
Ag Ext Officer	3		3	6
Cultv Off/Agr Serv			2	2
Colnz Off/Kachcheri	2	2		4
Irrig Off				
Co-op	1			1
Crop Insurance				
Private trader	1		1	2
Neighbor/relative	4	2	3	9
Police			1	1
within family			3	3
Satisfaction with Solution:				
yes	5	2	11	18
no	9	7	10	26

The most common approaches were to the local Vel Vidane or Agricultural Extension Officer (KVS), probably a reflection of th number of problems related to water, pests, diseases, and weeds. These were followed by appeals to neighbors, various government officals, and private traders. However, only 40% of the PSS respondents and 50% of the Giritale respondents felt that a satisfactory solution to the problem was attained.

Table 29. Methods of Giritale Households Seeking Solutions to Agricultural Problems Reported in the Third Field Survey (n=24)

	Head	Middle	Tail	Total
Households Seeking Solutions:	12	4	8	24
Type of Problem:				
water-related	6	3	5	14
pest/disease	7	2	3	12
weeds	0	1	5	6
conflict/dispute	0	1	1	2
economic	2	0	2	4
cattle trespass	1	0	0	1
Family Member Involved:				
male only	6	3	5	14
female only	0	0	0	0
male/female	2	0	0	2
Outside Contact:				
Vel Vidane	5	2	3	10
Ag Ext Officer	5	1	3	9
Colnz Off/Kachcheri	1	2	1	4
Irrig Off	1	0	0	1
Crop Insurance	0	0	1	1
within family	1	0	0	1
Satisfaction with solution:				
yes	4	2	6	12
no	8	2	2	12

DOMESTIC PRODUCTION SYSTEM

Domestic Activities

The farm women normally assumed responsibility for the activities associated with the household such as: cooking, cleaning, washing laundry, firewood collection, fetching water, marketing, and child care. With the increasing age of the PSS settlement many of these activities were shared by daughters, daughters-in-law, or even the third generation descendants. In addition, the male members of the household also assisted with marketing and firewood collection. These activities often involved traveling outside the neighborhood and women were more constrained by such time and travel requirements than men (with bicycles and tractor carts). Although not common, 14 PSS households and four Giritale households maintained a servant or laborer who lived with the family receiving room and board, and often a wage. The majority of these servants were males with only one female included, and their responsibilities consisted of collecting wood, tending animals, and assisting in field work. A few were also employed by households with boutiques and rice mills.

Table 30. Gender Division of Domestic Tasks in PSS households. (n=98)

Activity	(n=)	female only	males/ female	males only	Total female (Rel %) *
child care	(67)	64	3		100
firewood	(87)	63	10	14	84
water	(98)	87	9	2	98
marketing	(98)	29	15	54	45
sick care	(94)	55	31	8	91
meals for laborers	(93)	86	6	1	99

* The (Rel %) Total female participation is the sum of all cases of females participating in the activity, divided by the number of households performing the activity X 100.

One of the activities mentioned by women as most demanding was the meal preparation for hired labor crews during busy periods of the cultivation season. During these periods the farm women were preoccupied both with field work and household chores. In cases where a daughter could assist with some or all of these duties, women noted that they could spend more time in urgently needed field work.

While most families obtained domestic water from a well on the highland, a few women used neighbor or community wells, and two women from both PSS and Giritale cited a nearby irrigation channel as the source of their domestic water. Over half of the PSS wells used were concrete lined, compared with less than a third on Giritale. One third of all PSS women and one half of all Giritale women complained that they had some difficulty with

their wells during Yala. The most common complaint being the low water level, decreasing the quality of the well water. A few wells actually dried up during the latter part of Yala, requiring an alternative source. It was evident with observation that most of the wells on the highland depended on recharge provided by seepage from the nearest irrigation channel. Households located in the tail of the irrigation system experienced more difficulty with wells than households located in the head. This may be due to lower amounts of water in channels or delayed issues. Towards the end of the Yala cultivation, irrigation issues are normally reduced to coincide with the harvesting activities. During this period wells may be inadequate for domestic water.

Table 31. Gender Division of Domestic Tasks in Giritale Households. (n=50)

Activity	(n=)	female only	males/ female	males only	Total female (Rel %)
child care	(36)	32	3	1	97
firewood	(46)	28	8	10	78
water	(50)	48	1	1	98
marketing	(49)	20	18	11	77
sick care	(50)	36	11	3	94
food for laborers	(48)	47	0	1	98

* The (Rel %) of Total female participation is the sum of all cases of females participating in the activity, divided by the number of households performing the activity X 100.

Exploratory questions from the first survey indicated that a sizeable number of households traveled a distance of at least two miles to procure firewood. Further investigations revealed that generally, every few months (once for a season) several family members would make a trip to jungle areas to collect firewood. Most of these households were required to rent either animal or tractor carts, but some were able to provide their own transport. Commonly, firewood was collected by individual family members from jungle areas, but a few purchased wood from businesses or as scraps from the Timber Corporation.

Table 32. Information Regarding Domestic Water and Firewood. (PSS n=98) (Giritale n=50)

Domestic Water		PSS	G	Firewood	PSS	G
Source:				Source:		
well on highland		89%	80%	collect only	45%	56%
neighbors well		5%	12%	purchase only	32%	30%
community well		4%	4%	collect/purchase	22%	14%
irrigation channel		2%	4%	Distance:		
Distance:				nearby house	79%	62%
nearby house		92%	88%	1/2 to 1 mi	3%	10%
1/2 to 1 mi		8%	12%	2 or more mi	18%	26%
Description:						
earth		44%	62%	If 2 or more mi :	(18)	(13)
concrete lined		56%	26%	Transport:		
Yala problems		31%	52%	own animal cart	4	3
Head	(rel%)	21%	41%	own tractor cart	3	6
Middle	(rel%)	16%	60%	rental animal cart	7	3
Tail	(rel%)	46%	61%	rental tractor cart	3	2
				bicycle	1	
				Source:		
				jungle	14	13
				purchase	4	1
				Freguency:		
				weekly	2	3
				monthly	5	2
				3-4 months	9	4
				1-2 year	2	4

Home Gardening

The highland can also be considered as an important production unit, contributing toward the support of the farm family. During the Yala season, however, home gardening is limited due to insufficient rainfall and the absence of a water delivery system to the highlands. Less than one third of the PSS and Giritale households were gardening on the highland. These highlands were usually located in close proximity to an irrigation channel and almost invariably, water from the irrigation channel was tapped to cultivate the highland. Needless to say, the majority of highlands were not cultivated during Yala due to lack of water. As an alternative, some households were growing vegetables on the periphery or bunds of the irrigated fields. These small plots of vegetables (in the fields, on the highland, or around the house) were generally used for home consumption and only occasional sale. Consequently, the care of these gardens was not often considered "agricultural" work and many women neglected to mention the existence of these gardens. Only through successive probing and conversation conducted in all three field surveys was information on home gardening obtained.

Table 33. Information Regarding Gardening Activities.
(PSS n=98) (Giritale n=50)

	PSS	Giritale	PSS	Giritale
Type of Garden:				
Highland Garden	28 (29%)	14 (28%)		
Field Garden	15 (15%)	10 (20%)		
Highland Crop			28 (29%)	10 (20%)
Care:				
females only	12	2	12	3
males/females	11	9	10	1
males only	12	5	6	5
Water:				
field irrigation	15	10		
irrigation channel	8	4	12	6
drainage/seepage	6		12	2
rainfall	13	4	4	
well	11	7	3	2
Use:				
home only	24	7	8	1
home/sale	11	7	15	8
sale only		2	3	1

Throughout the study there was difficulty in defining "home gardens" as opposed to "highland crops". While both are important contributions to the farm household, the highland crop generally consists of a larger and more homogeneous stand than the home garden. The home garden is usually limited in scope and contains a more diverse mixture of vegetables. Furthermore, the highland crop has economic connotations not associated with the home garden. Although there was some attempt to classify the various gardening enterprises these definitions were not always uniformily applied.

Within the home garden category, there existed much diversity. Some of the most common vegetables were manioc, yams, and sweet potato due to their ease of cultivation and drought tolerance. Cowpea, long-beans, and lady's fingers (okra) were also popular. A scattering of other vegetables such as tomato, loofah, green gram, groundnut, brinjals (eggplant), snakegourd, onion, spinach and pumpkin were also noted.

During the Yala season, the price of vegetables locally is quite high. Most of the PSS and Giritale women reported that they had to purchase vegetables for family meals. Only two PSS women reported that their home gardens were sufficient to supply vegetables for family meals. When women were asked why they did not also grow vegetables in their fields, where there was access to water, they indicated that they preferred to put most of the area into paddy cultivation, leaving little space for other crops to be grown. Indeed, the preference to cultivate paddy is very noticeable in these settlements, compared to other more recent settlement projects. In addition, women reported that the area given to vegetables in the fields was limited based on the amount of family labor available after the requirements of

the irrigated crop were met. Unsuitable soil or moisture conditions, animal tresspass, and theft also seemed to be important consideration.

Table 34. Gardening Constraints of Respondents.*
(PSS n=98) (Giritale n=50)

Home Gardens	PSS	Giritale	Field Gardens	PSS	Giritale
no water	39	25	no space	44	10
no space	15	3	no time/labor	18	9
poor soil	7	2	theft	18	4
animal damage	6	4	animal damage	8	1
no time/labor	5	1	soil/water problems	7	6
theft	4				

* Multiple responses are possible.

When the highland was favorably located with respect to an irrigation channel, the preference on PSS appeared to be the cultivation of paddy, chili, or tobacco rather than vegetables for home consumption. Of the 28 PSS households cultivating a crop on the highland, 14 cultivated paddy, 13 cultivated chili, 3 cultivated tobacco, and 9 cultivated vegetables such as green gram, cowpea, onion, and squash. On the other hand, only two of the ten Giritale households were cultivating paddy on the highland. In fact, vegetable cultivation as a highland crop also exceeded that of chili in the majority of Giritale households. It may be that most of the Giritale highlands are not able to obtain irrigation water as easily as those on PSS.

The irrigation of these allotments is a sensitive subject and highly illegal. However, many women did respond that the nearby channel was the source of water for the highland crop. Excluding the Weera Pedesa area of PSS (entirely encroached reservation) 30% of the highland allotments on the PSS settlement were used for extensive cultivation. While the farm household may realize definite benefits from such an endeavor, it is presently incompatible with the design of the irrigation system and undoubtedly has a significant effect on the delivery of irrigation water to the fields.

Permanent Tree Crops

Ninety-six percent of PSS households and 100% of Giritale households cultivated some type of permanent trees on the highland. By far, the most common being coconut, followed by mango, banana, and jackfruit. In addition, a wide variety of other tree crops were also noted, including: papaya, breadfruit, guava, orange, lemon, lime, tamarind, pomegranate, areca nut, cashew, palmyra, king coconut, wood apple and custard apple, as well as other minor berries and fruits. While the majority of women stated that these products were used solely for home comsumption, 26% of the PSS women and 18% of the Giritale women replied that occasional sale of produce occurred. Women responded that they would sell some fruit or coconuts from time to time when cash was required and a surplus

of produce existed, but no regular marketing of produce was identified. In fact, most women could not recall or estimate the cash received by this occasional sale. Without some sort of record keeping system it would be difficult to quantify the economic contribution.

Livestock

The highland acreage also provides an opportunity for keeping livestock. Eighty percent of the PSS households and 70% of the Giritale households were keeping some kind of livestock; the most common being water buffalo, cattle and poultry.

Table 35. Information Regarding Livestock Production. (PSS n=98) (Giritale n=50)

	PSS	G		PSS	G
Type of Animal:			Feed:		
Buffalo	49	30	fodder cut	40	21
Cattle	45	19	females only	8	8
Goats	4	12	males/females	11	2
Pigs	1		males only	21	11
Poultry	32		tied to graze	49	20
Care:			females only	4	4
females only	15	8	males/females	9	2
males/females	21	5	males only	36	10
males only	39	22	roam freely	21	11
Water:			Ande:		
channel	43	21	given-out	5	5
hand carry	36	14	taken-in	18	7
lake	1	2			
Use:					
home only	49	16			
home/sale	16	4			
land prep	39	29			
rental	6	3			

Families with buffalo generally had at least one pair, used for their own land preparation. In addition, some households rented out buffaloes during the land preparation period. The care of these animals was generally relegated to family males, but some women also assisted with animal care as well as cutting fodder.

A number of households had taken-in or given-out animals on ande. In this arrangement, the care, feeding, and herding of animals is given over to another party. An agreement is made concerning the milk, meat, labor use of the animals, and young produced. The advantage to the owner being the savings of time and labor in animal care. Only one PSS household was involved in large scale poultry production (a recent Kantha Samithi project) with others maintaining only a few poultry for occasional home use. One PSS household was also engaged in the unusual enterprise of raising and marketing fresh water fish in tanks constructed on the highland.

Domestic Decision-making

Overall, discussion and shared decision-making by both the husband and wife was the most common process by which decisions in the home were made. The husband sometimes predominated on subjects such as the sale or purchase of livestock and taking or repaying loans (other than agricultural). However, there were a few subject (schooling of children, gifting to relatives and the temple, and pawning of jewelery for cash) in which the influence of women alone equaled that of males. decisions made most often by women alone included the day-to-day management of household expenses, determini gifts and obligations to relatives and the temple, and the purchase of clothing and textiles. In the case of widows, most of the decisions were either made alone, or with occasional consultations between relatives and neighbors.

Table 36. Gender Division of Domestic Decisions in PSS Households. (n=98)

		females only	males/females		males only	Total female
			husband & wife	misc. comb.		
Subject	(n=)					Rel% *
day-to-day expenses	(95)	26	29	8	32	66
house const/repair	(80)	11	36	17	27	70
major purchases	(88)	8	38	11	31	65
schooling children	(67)	13	36	7	11	84
animal sale/purchase	(75)	7	29	11	28	63
taking/repay loans	(76)	16	21	8	31	59
pawning articles	(59)	10	28	10	11	81
gifts temple/reltv	(92)	27	35	13	17	82
purchase textiles	(95)	33	36	9	17	82

* The (Rel %) of Total female participation is the sum of all cases where females participated in the activity divided by the number of households engaged in the activity X 100.

The decision-making process within a family is difficult to address through a survey. While the opinions of the field investigators were that the farm women spoke candidly of these subjects, much of the internal process of family decision-making probably still remains hidden from the view of outsiders.

Table 37. Gender Division of Domestic Decisions in Giritale Households. (n=50)

Subject	(n=)	females only	males/females husband & wife	males/females misc. comb.	males only	Total female Rel% *
day-to-day expenses	(31)	19	15	5	11	78
house const/repair	(45)	6	20	9	10	78
major purchases	(44)	4	15	11	14	68
schooling children	(44)	12	19	2	11	75
animal sale/purchase	(41)	9	9	5	18	56
taking/repay loans	(39)	6	7	9	17	56
pawning articles	(24)	5	7	7	5	79
gifts temple/reltv.	(50)	20	20	5	5	90
purchase textiles	(50)	18	17	7	8	84

* The (Rel %) of Total female participation is the sum of all cases where females participated in the activity divided by the number of households engaged in the activity x 100.

Domestic Information

Traditional experiences and knowledge handed down within the family was the major source of information on household management for women. Twenty-three women from PSS were identified who had participated in some sort of training class such as: sewing and weaving (11), home gardening and agriculture (7), cooking, health, and nutrition (5). Only seven Giritale women reported some sort of training in subjects such as: sewing/weaving (4), gardening (1), and pottery crafts (1).

Table 38. Domestic Topics of Interest to Respondents. * (PSS n=98) (Giritale n=50)

Type of Information	PSS	Giritale
food preparation	29	9
health/nutrition	27	4
income generation	27	16
sewing/handicrafts	23	5
home gardening	14	7
animal husbandry	11	5
record keeping	1	
not seeking info	29	19

* Multiple responses are possible.

Seventy percent of the PSS women and 62% of the Giritale women were seeking specific household information, although many expressed that even when information was available they would have little chance to participate due to a full work schedule.

Unfortunately, many of the subjects mentioned by women were not often related to the training or instruction they had received. Instead, the majority of training was in areas of handicrafts, sewing, and weaving. A number of women expressed special interest in alternative sources of income generation that would be possible for them to undertake during the slack periods of the cultivation season, and during Yala (since most were unable to maintain much of a garden in that season). Although the Agricultural Extension staff is charged with providing information about home gardening, there were no reports from women about this activity.

Domestic Constraints

Certain physical problems such as the accessibility of water to the highland has already been mentioned as a constraint to home gardening during the Yala season. In addition, other gardening constraints such as poor soil (sandy, rocky, and infertile) and damage by animals (free-roaming cattle, monkeys, deer, and wild boar) were reported. The fragmentation of the highland among family members with several homes occupying the original three acres was also common, further effecting the productivity of the highland.

Table 39. Domestic Constraints of Respondents.
(PSS n=98) (Giritale n=50)

	Primary		Others *	
Type of Constraint	PSS	Giritale	PSS	Giritale
water availability	68	34	8	
poor soil/rocks	3	3	23	11
animal damage	3	4	22	13
fragmentation/disputes	6	2	5	1
flooding/seepage	2	1	2	3
theft	1	2	1	5

* Only one response was possible for the Primary problem, but Others is the sum of multiple responses.

While many of these problems are primarily physical in nature, many women felt that their lives were filled with stress from economic difficulties as well as community conflicts. For example, a few cases were noted where even the highland, in addition to the fields, had been leased or mortgaged out to meet unexpected debts such as funerals or court cases concerning water and boundry disputes. On occasion, women also mentioned the indebtedness of the household due to drinking or gambling habits of the husband. Some of the internal problems of numerous extended families occupying the same highland allotment were also referred to by both mothers-in-law and daughters-in-law. Although they may directly influence the operation and management of the farm, they were not pursued in this study due to their sensitive nature.

FAMILY HEALTH AND NUTRITION

While it is generally recognized that irrigation developments have potential for both negative and positive effects on family health and nutrition, this was not a primary focus of the study. A dietary or nutritional evaluation is a very difficult and complex task requiring specific methodology that cannot be substituted by a survey questionnaire. With these constraints in mind, it was felt that perhaps some insight and useful information might be gained by the attempt to include a few questions related to this topic.

Some questions throughout other sections may also give some indirect information about health and nutrition. For example: the availability of water to the highland limits home gardening, which in turn, means that vegetables are more often purchased, and women collect fresh greens as a supplement. In addition, while leguminous vegetables were found in many home gardens, an equal amount of less nutritious vegetables such as loofah and various gourds were also identified. Women related that the gourd type of vegetables were more drought tolerant and less preferred by livestock and wild animals. Obviously the constraints to growing vegetables on the highland during Yala may significantly effect family diet.

Women were asked to describe the most recent "main" meal they had eaten. Care was taken to stress the collection of information about what they themselves had eaten, not what they cooked or others ate. The most common form of carbohydrate was of course rice, although a few mentioned manioc or bread. Among the vegetables mentioned, the most common were pulses (the legume family) such as dhal, green gram, long-bean, and cowpea. The use of these high protein vegetables, in combination with fresh greens would be considered quite nutritious. The starchy vegetables such as yams, plantains, and jackfruit were more often mentioned by Giritale women than PSS women. Although it may be that they are not predominant in the diet of PSS women, it should also be noted that these vegetables have a relativily low status which may have influenced the information collected. As expected, sources of animal protein were mainly limited to fish. Both dried fish and the commonly available fresh tank fish were reported as part of the meal. Two PSS women included beef in their meal, and three had eaten eggs. While fruit is not generally considered part of the meal, fresh fruit is generally consumed several times a day between meals. The use of milk was almost exclusively for young children, and not usually a part of the adult diet, even for pregnant or nursing mothers.

Only two PSS women reported that they were able to support their family with vegetables from the home garden. In all other cases, women were required to purchase either some or all of their vegetable requirement. In fact, approximately 70-75% of all households were exclusively purchasing vegetables for family meals during the Yala season. Fortunately, most of the women also collected fresh greens to supplement the family diet.

Table 40. Family Nutrition Sources and Diet of Respondents. (PSS n=98) (Giritale n=50)

Garden Vegetables	PSS	G	Female Diet	PSS	G
Legumes:			Starches:		
long-bean	22	12	rice	93	50
cowpea	15	3	bread	2	
green gram	8	7	manioc	1	
winged-bean	2		Vegetables:		
groundnut	1	1	legumes	47	27
Gourds:			gourds	21	15
loofa	21	10	other veg	17	12
snake gourd	13	1	starches	5	17
cucumber	11	8	fresh greens	26	12
pumpkin	8	8	Meats:		
bitter gourd	6	1	dried fish	34	18
Other Vegetables:			fresh tank fish	21	13
ladyfinger	15	7	beef	2	
brinjal	7	5			
chili	6	7	eggs	3	
capsicum	3				
tomato	2	1	Family Vegetables:		
onion	2	1	purchase only	76	34
radish	1	1	purchase/grow	20	16
Starches:			grow only	2	
manioc	20	9	collect greens	94	48
yams	3	1			
sweet potato	2	1			

-- The figures for items in home gardens are the sums of the items mentioned by women with gardens either on the highland or in the fields, used primarily for home consumption.
-- The figures for items in the diet are the sums of the items mentioned by women for their most recent main meal.

As previously mentioned, four women from PSS and Giritale reported that their source of domestic water was the nearby irrigation channel. Irrigation channels are used for a variety of purposes including bathing and laundry, washing vehicles, and wallowing buffalo. In addition, irrigation water is likely to be contaminated by runoff or seepage containing agrochemical residues.

When women were asked if they boiled their drinking water, 47% of the PSS women and 34% of the Giritale women replyed affirmatively. Again, the magnitude of this response may be due somewhat to a perceived "correct" answer. Even if this were the case, for a large number of households it would be ineffective because other sources of drinking water were used while working in the fields. These were mainly wells located in or near the paddy fields and are extremely shallow and therefore subject to contamination by agrochemical as well as human wastes.

Approximately 90% of the households had their own latrine, but almost half of the women interviewed expressed dissatisfaction. The most common complaint was that the latrine had been built as a temporary structure and was old and decrepit, as it had never been replaced by a permanent concrete structure. A few women also remarked that during Maha the latrines were subject to seepage and overflow.

One third of the PSS women and 42% of the Giritale women mentioned that they occasionally had problems with seepage and poor drainage around the house during seasonal rains. In addition to being an inconvenience, some of them remarked that it caused sores to form on their feet and increased mosquitoes. Various other "fevers", colds, and cough were also associated with poor drainage around the house.

INCOME AND EXPENDITURES

Income Sources

As expected, the primary source of income was the irrigated crop for those households cultivating during the 1985 Yala season. The major source of income for non-cultivating households was a portion of the crop returned from either ande or wee porunduwa. Even among a number of PSS cultivators, the primary income was from an off-farm job. Approximately 5% of the PSS households had a family member working as a government worker, teacher, clerk, bus driver, etc. providing the primary income of the family. While few Giritale households were supported by off-farm jobs, others relied upon casual wage labor. Two PSS households with mortgaged fields reported that the highland crop and chena were their main sources of income.

Table 41. Primary and Other Sources of Income of Respondents. (PSS n=98) (Giritale n=50)

	Primary		Others *	
Income Source	PSS	Giritale	PSS	Giritale
irrigated crop	84	44	1	2
highland crop	1		20	9
veg/fruit/coconuts			26	14
business/service			23	9
casual wage labor		3	22	23
off-farm job	5	1	20	9
animal products/draft			15	5
equipment rental			15	5
ande/wee porundura	7	2	10	6
relative contribution			4	
leasing for cash			2	5
chena cultivation	1			

* Only one response was possible for the Primary income, but Other is the sum of multiple responses.

Although the primary source of family income is from paddy cultivation, other supplemental sources of income generally do exist and should be identified. Approximately 70% of all PSS households and 80% of all Giritale households identified some form of income, in addition to the irrigated crop. The contribution of the highland was considerable when the major portion was either in paddy, chili, or tobacco. In fact, as previously mentioned, it sometimes was the only source of family income due to the fragmentation or mortgaging of fields. Although difficult to quantify, the combination of a crop or fruits and vegetables grown on the highland was the most common means of supplementing family income on PSS. Other significant contributions included earnings from a business or service, wage or casual labor, animal husbandry (both draft power and products), and equipment rental. The most significant contribution to Giritale households was from the casual wage labor of a family member, with 46% of all households receiving income through this source.

In addition, a minimal contribution in the business/service category was provided by women through activities such as weaving mats and cadjans, dressmaking, brickmaking, traditional medicinal treatments, and midwifing. One PSS woman owned and operated a bakery and boutique, while an elderly Giritale woman was engaged in the business of transporting vegetables from gardens in the area by cart to the pola for sale.

When women were asked how they might be able to increase their income, 55% of the PSS women and 42% of the Giritale women responded with specific ideas. It was interesting that most of the PSS women perceived of increasing their income mainly through increasing their paddy yields (either through higher yielding varieties, inputs, or increased acreage). In addition, some women mentioned cultivation of subsidiary crops, animal husbandry, off-farm employment, handicrafts, and business ventures. On the other hand, the interests of Giritale seemed to be fairly diverse with women citing a variety of possible activities.

Table 42. Income Generation Ideas of Respondents. *
(PSS n=98) (Giritale n=50)

Activities	PSS	Giritale
paddy production	21	4
subs crops/gardens	10	2
animal husbandry	8	4
sewing/crafts	8	5
off-farm employment	8	4
business/service	5	3
not interested	43	29

* Multiple responses are possible.

Expenses

The majority of family expenses revolved around family subsistance and agricultural input needs. No doubt, these probably compete in households of limited finances, with family subsistance barely preceeding agricultural expenses. As previously noted, almost all of the women reported that they purchased some vegetables for family meals while only two PSS women indicated that their gardens were sufficient to supply their family with vegetables. In addition, a total of 22% of both PSS and Giritale families responded that they purchased some rice for family meals (only 2% on PSS and 8% on Giritale exclusively purchased rice). Priorities for education of children, and health and medical expenses followed in the primary expenses category. Women from PSS also included the repayment of loans as a primariy expense, although this was not indicated by Giritale women.

The secondary expense category remained dominated by subsistance and agriculture; followed by health and medical expenses, children's education, and loan repayment . Finally, in the tertiary expense category, health and medical expenses and children's education were followed by clothing and textiles.

Table 43. Prioritization of Family Expenses by Respondents. (PSS n=98) (Giritale n=50)

Expense Item	Primary		Secondary		Tertiary	
	PSS	Giritale	PSS	Giritale	PSS	Giritale
	%					
family needs	44	48	48	48	8	4
agricultural inputs	42	42	28	26	9	12
child's education	5	4	7	6	23	22
health/medical	2	6	8	10	26	26
loan/pawn repayment	6		6	6	8	4
household items	1				2	4
clothing/textiles			1	2	14	28
savings			1		3	
house const/repair					2	
entertain/gifts					2	
business					1	
animal care				2	1	

Overall, 20% of the PSS respondents and 10% of the Giritale respondents ranked loan repayment as one of their top three expenses. Unexpected expenditures such as illness, death, court cases, and weddings often required families to borrow from private money-lenders since the cooperative loans were limited to agricultural needs. Other methods of covering financial shortages during the cultivation season included pawning of radios, cycles, and jewelery. In one case, the farm woman noted that the family had been required to actually purchase their rice requirements because, due to unanticipated expenses, the entire portion of harvest kept for the family had been sold.

The increasing age of the PSS and Giritale colony is reflected in the concern regarding health and medical expenses. Thirty-five percent of the PSS respondents and 21% of the Giritale respondents cited this as one of their top three expenses.

On PSS, items such as children's education were included as first, second, and third priorities, while savings was not included until second priority, and household items, textiles, and clothing were not named until third priority. Education of children was also a top priority on Giritale, but other subjects such as savings, house construction or repair, entertainment and gifts, and business expenses included by PSS women were absent from the priorities of Giritale women. However, the category of clothing and textiles was more often included by Giritale women than PSS women as a spending priority.

Spending Preferences

When asked what an unexpected, large sum of cash (such as a lottery winning) would be used for, the majority of PSS and Giritale women responded with either new home construction or improvement of the existing home. Second choice for PSS women was divided between purchasing or leasing in lands, and establishing a savings. The purchase of agricultural

equipment ranked third, with mortgage/loan repayment fourth, followed by children's education and community development. As a second choice, Giritale women preferred to either repay mortgages and loans, or provide education for children. The purchase of agricultural equipment ranked third, followed by the establishment of a savings, starting or improving a business, purchasing or leasing-in lands, and household items. While a number of PSS women reported that they would use some of their "winnings" for community improvements or gifts to the temple, none of the Giritale women mentioned this possibility.

Table 44. Spending Preferences of Respondents. *
(PSS n=98) (Giritale n=50)

Lottery Winnings	PSS	G	Seettu Shares	PSS	G
house const/repair	39	17	household items	6	3
purchase/lease-in lands	18	3	savings	4	3
savings	18	6	loan/pawn repayment	3	3
agricultural equip	17	7	poultry	1	
mortg/loan repayment	12	8	agric equipment	1	2
children's education	10	8	Respondents	(15)	(9)
community/temple gift	10				
household appliances	2	1			
car/motorcycle	1				
business investment	1	4			

* Multiple responses are possible.

Fifteen PSS and nine Giritale women reported that they belonged to a seettu group, an informal arrangement where shares are pooled and the "pot" goes to individual members in sequence. When these women were asked about what they had used their shares for (or intended to use them for), the majority of PSS women responded that they had (or would) purchase household items or furniture. Others indicated that they had (or would) use their return of the shares for savings, loan and pawn repayment, poultry, and agricultural equipment. This unique method of saving was also important when women required cash for occasions such as weddings, almsgivings, or funerals.

Shortly after the Yala season harvest was completed, the third field survey was conducted. One objective of this survey was to investigate the management of cash received from the harvest. At this time in the cultivation season farm households acquire relativily large amounts of cash, while debts also are due. The greater income from the irrigated field crop is normally relegated to repayment of the previous seasons debts and purchase of necessary items for the ensuing cultivation season. The remainder becomes available for family needs and non-essential items. While the income from the highland cultivation was primarily for family needs, agricultural investments and loan repayment were also important.

Table 45. Harvest Cash Expenditures of Respondents. *

Field Crop	PSS	G	Highland Crop	PSS	G
Households Marketing:	(75)	(42)	Households Marketing:	(18)	(9)
loan repayment	46	27	family needs	8	9
agric inputs	26	16	agric inputs	5	1
family needs	17	14	loan repayment	4	1
child's educ	8	2	child's educ	2	
house const/repair	7	6	house const/repair	2	
savings	5	1	business	2	
business	2				

* Multiple responses are possible.

Family Resource Management

In approximately half of the PSS and Giritale households, individuals earning cash contributed all of their earnings to the family, while others contributed at least part of their income to the family. In some cases, where individuals were engaged in a business or service, the cash was returned back to the operation for equipment, supplies, etc.

Table 46. Management of Family Resources. (PSS n=98) (Giritale n=50)

Individual Earnings:	PSS	G	Family Cash Management:	PSS	G
keep all	10	1	females only	21	17
contribute part	22	10	males/females	31	9
contribute all	41	25	males only	45	24
Household Cash:			Personal Cash:		
husb/son/family	44	14	fruit/coc/veg	21	10
own control	29	10	livestock/poultry	11	
neighb/boutique	22	20	crafts/sewing	10	3
sell home paddy	2	1	job/wage labor	6	11
own business	1	1	neighb/boutique	3	
Household Allowance:	31	9	tractor hire	2	1
			business savings	1	1
			Free access to Cash:	55	17

When women were asked about the management of family cash, the most common reponse was that this was the responsibility of male family members, but management was shared between males and females in a significant number of PSS families. In addition, 21% of the PSS households and 34% of the Giritale households, women reported that they alone managed the family cash. The higher figure for the Giritale scheme may be due to the greater number of widowed households in the survey sample. These women assuming sole responsibility for family cash management were: 18 widows, 13 wives, 3 daughters, and 4 daughters-in-law.

Household expenses that were managed by women were met by cash obtained from a variety of sources. The majority of women reported that they obtained cash from the husband, son, or other family members. In fact, 31 PSS women and 9 Giritale women reported that they were given an allowance by their husbands

(or son) to cover household expenditures. However, a surprisingly high number of women reported that they themselves controlled the cash for household expenses. Additionally, a common source of ready cash existed for temporary use from either neighbors or the local boutique. Women reported that when a small amount of cash for daily needs was required they would borrow from these sources. One PSS woman who owned and operated a small bakery and boutique reported that she used her profits for both household and personal expenses.

Women were also asked how they obtained cash for their own personal use. The most common means on PSS was through sales of fruit, vegetables, or coconuts, followed by: livestock and poultry, sewing, weaving, and handicrafts, jobs or wage labor, and small loans from neighbors or boutiques. In addition, two women owned tractors and rented them, while one woman maintained a personal savings from her business. Giritale women primarily relied on their own wage labor earnings for personal cash, but also sold fruits and vegetables. An elderly Giritale women was also earning money by collecting vegetables from gardens in the area and transporting them by cart to the pola for sale.

Despite the apparent control of family finances by male family members, 55 PSS women claimed that they had access to family cash for use as they wished, compared to 17 Giritale women. The practice of borrowing cash from neighbors or boutiques may be a result of the overall limitations of the family budget during most of the cultivation season, or simply reflect the unavailability of ready cash to women themselves.

Purchasing Power

Because the management within the family of resources (especially cash) is a complex process and may not be readily discussed with outsiders, a series of questions about general purchases were included. In this manner, the individuals actually conducting the purchase are identified. While this does not account for the actual management of cash, it may offer insights into the purchasing power of various family members.

Table 47. Gender Division of Purchases by PSS Family Members.

Purchases	(n=)	female only	male/ female	male only	Total female (Rel %)*
seed paddy	(63)	5	4	54	14
agrochemicals	(86)	5		81	6
farm tools	(93)	10	3	80	14
farm equipment	(65)	3	4	58	11
textiles/clothing	(96)	36	33	27	72
cooking utensils	(97)	62	16	19	80
food/daily needs	(96)	30	9	57	41
home furnishings	(82)	9	27	46	44
major items	(71)	6	19	46	35

* The (Rel %) of Total female participation is the sum of all cases of females purchasing the item, divided by the number of households purchasing the item, X 100.

As expected, most of the purchases relating to the farm operation such as seed paddy, agrochemicals, hand tools, and equipment were conducted by males, but the involvement of women increased when major items and home furnishings were purchased. Women were primarily responsible for purchasing textiles, clothing, and cooking utensils. One item of note concerned the purchase of food and daily items. In a large number of households this was primarily a male responsibility and can probably be attributed to the time and travel constraints of women.

Table 48. Gender Division of Purchases by Giritale Family Members.

Purchases	(n=)	female only	male/ female	male only	Total female (Rel %)*
seed paddy	(23)	4		19	17
agrochemicals	(40)	4	1	35	12
farm tools	(49)	6	1	42	14
farm equipment	(25)	1	4	20	20
textiles/clothing	(49)	22	15	12	75
cooking utensils	(50)	33	9	8	84
food/daily needs	(50)	23	9	18	64
home furnishings	(36)	8	12	16	56
major items	(29)	2	13	14	52

* The (Rel %) of Total female participation is the sum of all cases of females purchasing the item, divided by the number of households purchasing the item. X 100.

COMMUNITY PARTICIPATION

When farm women were asked about the existence, function, and their participation in formal community organizations and societies, a number of confusing responses resulted. For example, some women said that certain women's societies existed in their area, although few were members, while other women stated that these societies did not exist. More importantly, many women claiming to belong to women's societies were unable to define any specific activity conducted by these organizations. Finally, by the third survey, 25 PSS women and 16 Giritale women were identified who belonged to community societies, and their attendance and activities were noted.

Table 49. Participation of Respondents in Community Societies. (PSS n=25) (Giritale n=50)

	Members		Attend		Activities	
Society	PSS	G	PSS	G	PSS	G
Kantha Samithi	15	10	15	10	12	6
Rural Dev Soc	6	6	6	5	5	3
Kulangana Samithi	12	2	12	2	11	2
Death Donation	6	6				
Co-operative	1	1				

The most popular society appeared to be Kantha Samithi, the women's division of the Rural Development Society. All of the women members had attended meetings in 1985 and most had participated in an activity this year. Some of the various activities reported by PSS Kantha Samithi included: setting up a sewing center and organizing classes in sewing, establishing pre-schools, participating in shramadana (road repair, and construction of community buildings), making bricks for sale and members use, constructing latrines, shramadana agricultural work, and granting agricultural loans to members. The Kantha Samithi located in the D19 channel area of the Giritale scheme was particularily interesting. This society retained ownership of approximately one-half acre of land which was given to members for cultivation. Any profits realized were returned to the society for new projects. In addition, the Giritale Kantha Samithi societies had performed various shramadana activities and community improvements.

Although males are the majority in the Rural Development Society, membership is not restricted to men and six women from PSS and six women from Giritale reported membership in the RDS. Most of these had attended meetings, and a number had participated in activities this year. The RDS activities on PSS included road and rund repair through shramadana, granting agricultural loans, and construction of houses through a Gramodaya Mandelaya project. The Giritale RDS had obtained tubewells and provided loans for house construction to members. They also conducted various shramadana and community work projects.

Twelve PSS women and two Gritale women belonged to the more formalized women's temple society, Kulangana Samithi. They had attended meetings and most participated in activities this year such as community shramadana and specific religious ceremonies.

In addition, six PSS and six Giritale women were members of the local Death Donation Society, where dues are paid to a fund for the funerals of contributing members (which can normally be a large burden on family finances).

The overwhelming response from the majority of farm women who did not belong to societies was the lack of available time to participate. However, ten PSS women complained that they would join, but there were no socieities available in their area (LB2 of RB1-tail).

By far, the most common forms of community interaction were the informal groups which revolved around daily activities. Approximately 60% of the PSS women and 76% of the Giritale women reported that they belonged to at least one informal group in their area. The most popular were the temple groups; performing religious ceremonies, shramadana, and pilgrimages. These were followed by shramadana groups organized around specific activities, groups of women performing attam and agricultural wage labor, and seettu groups (a pooled contribution of shares). Other small groups of friends would go to the market, collect firewood, and wash laundry together.

Table 50. Participation of Respondents in Informal Groups. *
(PSS n=98) (Giritale n=50)

Informal Groups	PSS	Giritale
temple/religious	58	34
seettu	15	9
shramadana	21	17
road/channel	14	11
community	5	7
cult triangle	4	3
agricultural	2	1
attam/labor crew	19	17
market/pola	9	3
bathing/laundry	5	3
firewood	3	7
hospt/dispensary	2	
no participation	40	12

* Multiple responses are possible.

Women rarely participated in Kanna (pre-cultivation) meetings. While 43% of the PSS households reported that a member of their family had attended the 1985 Yala season Kanna meeting, only one woman participant was noted. However, 52% of the Giritale households reporting attendance at the 1985 Yala meeting included four women. These Giritale women were composed of three widows and one wife. Based on observations of the 1985 Yala season Kanna meetings, the total number of households

reporting attendance at the 1985 Yala season Kanna meeting was probably an inflated figure, and may be due to the perception of a "correct" response.

When the third field survey was conducted, the Kanna meeting for the 1985 -86 Maha season had been held on PSS and Giritale. Twenty-eight percent of the PSS households reported that a member of the family attended the Maha meeting, with five women participating in this meeting. All five of these women were located in the same area (RB 7 of the D1 North Channel), and consisted of four widows and one daughter-in-law. On Giritale, only 32% of the households indicated that a family member had attended the 1985-86 Maha meeting, with one woman included.

Table 51. Perceptions of PSS Respondents Concerning Water User Associations. (n=98)

	Head(38)		Middle(19)		Tail(41)	
Water User Assoc in Area?						
yes	14	(37%)	2	(11%)	11	(27%)
no	22		16		28	
don't know/no resp	2		1		2	
Family Member in Assoc?	9		2		8	
very satisfied					1	
satisfied	8				7	
unsatisfied			1			
no resp	1		1			
Is an Assoc Needed?						
yes	24	(63%)	14	(74%)	25	(61%)
no	4		3		2	
don't know/no resp	10		2		14	
Would You Join?						
yes	20		11		19	
no	4		3		6	
Highland Irrigation in Area?						
yes	10	(26%)	9	(47%)	25	(61%)

When women were asked about the existence of water user groups in their area, 27 PSS women responded that such a group existed, while 20 of them also reported that someone from the family was a member (one woman member was included). Only nine Giritale women responded that they were aware of such a group, while four of these women replied that a family member participated. Another 25 PSS women and 17 Giritale women stated that even though there was no organized water user group in their area, informal action (usually through the Vel Vidane) was the method of solving water problems. Satisfaction with the various methods of solving water problems was highly variable and seemed to depend upon the individual efforts of the particular Vel Vidane. Some women reported that the local Vel Vidane was effective, while others claimed that he was only concerned with the collection of his remunerations and was of no assistance.

As in the case of other community organizations, there was very little understanding on the part of women about the objectives, function, and benefits of a water user group. However, approximately 65% of the PSS and Giritale women expressed the opinion that a group was needed to resolve problems concerning irrigation water, and the majority stated that they would be willing to join such a group. On Giritale, there appeared to be more interest in forming water user associations in the tail areas compared to the head. Interest was fairly evenly distributed among head, middle, and tail PSS women.

When asked about the illicit tapping of water from the irrigation system for highland cultivation, 45% of the PSS women responded that this occurs in their area. Only 28% of the Giritale women reported illicit tapping of water for the highland in their area. It may be that the majority of highlands in Giritale do not have easy access to the irrigation sytem. In addition, a number of women from both schemes commented on the need to prepare a strict code of discipline with enforced punishments for law breakers (also including infractions related to field irrigation).

Table 52. Perceptions of Giritale Respondents Concerning Water User Associations. (n=50)

	Head(22)	Middle(10)	Tail(18)
Water User Assoc in Area?			
yes	5 (9%)	1 (10%)	3 (17%)
no	17	7	15
don't know/no resp		2	
Family Member in Assoc?	2	1	1
very satisfied			
satisfied	2	1	1
unsatisfied			
no resp			
Is an Assoc Needed?			
yes	12 (55%)	5 (50%)	15 (85%)
no	6	4	2
don't know/no resp	4	1	1
Would You Join?			
yes	10		12
no	2	5	3
Highland Irrigation in Area?			
yes	3 (14%)	6 (60%)	5 (28%)

Overall, 67% of the PSS women and 74% of the Giritale women interviewed expressed satisfaction with the colony scheme. However, only 10-11% found colony life "very" satisfactory, while 16-19% expressed dissatisfaction. Among those satisfied, or very satisfied; land ownership was judged to be the prime consideration, followed by earning a good income.

Table 53. The Satisfaction of PSS Respondents Regarding the Colony. (n=98)

Satisfaction Level	Head(38)	Middle(19)	Tail(41)
very satisfied	4	4	2
satisfied	27	12	27
unsatisfied	6	3	10
no response	1		2

The PSS women expressing dissatisfaction related this primarily to poor facilities (such as shops, schools, markets, and health care), problems with water (both delivery to the fields and inaccessibility of the highland to water), and economic difficulties (caused by loss of paddy lands through mortgaging and the high costs of agricultural inputs). It was interesting to note that the highest proportion of dissatisfaction on PSS was associated with the tail regions of the irrigation system.

Table 54. The Satisfaction of Giritale Respondents Regarding the Colony. (n=50)

Satisfaction Level	Head(22)	Middle(10)	Tail(18)
very satisfied	1		4
satisfied	18	9	10
unsatisfied	3	1	4
no response			

On the other hand, women from Giritale largely complained about their poor income and economic conditions from the combination of mortgaging, agricultural input costs, and unavailability of loans. Various other responses from Giritale women included: land fragmentation and disputes, climatic differences from the original village (in the Up-Country, Wet Zones), and irrigation problems. It was interesting to note that although the highest proportion of dissatisfaction on Giritale was found in the tail regions, the relative proportion of very satisfied households were also located here. There may be a greater disparity here between successful households and those who fail in farming, compared to other locations in the irrigation system.

When women were asked their opinions about how colony life could be improved, most women responded strongly, with very specific ideas. Many suggested that delivery of water and electricity to the highlands would be a substantial improvement. Additionally, road and transportation improvement, solving irrigation problems, and employment opportunities ranked high. Giritale women seemed particularly disturbed by the increasing costs of agricultural inputs and the low guaranteed price of paddy. They suggested that only through government intervention would their families be spared increasing hardships. One subject mentioned by women concerned the need for government to resolve the social and economic problems due to the increasing land fragmentation within the colony.

Table 55. Suggestions by Respondents for Colony Improvements.* (PSS n=98) (Giritale n=50)

Colony Improvements	PSS	Giritale
highland water	38	34
electricity	38	12
roads/transp	36	17
irrig problems	25	7
employment	20	15
health care	18	4
schools/shops	11	7
frag/disputes	11	6
cost of living	10	14
no response	3	1

* Multiple responses are possible

These colonies are diverse social communities composed of settlers and various entrepreneurs. Although these settlements are some of the oldest in the Dry Zone, the complex interactions between kin and neighbors found within a traditional village are less developed and many of the support systems normally provided by relations or the community may be absent. Therefore, an attempt was made to evaluate the level of community involvement.

Table 56. Community Interation of Respondents. (PSS n=98) (Giritale n=50)

Sources of Assistance	PSS	G	Exchange of Items	PSS	G
relatives	38	8	often	7	4
neighbors	43	5	sometimes	62	32
govt/officers	7	3	never	29	14
temple	4	1	Relatives Nearby		
businessmen	4	3	yes	62	28
local organiz	1		no	36	22
no response	1				

During times of crises or emergency, women stated that they relied heavily upon nearby relatives within the colony and close neighbors for assistance. In fact, over half of all women reported that relatives lived "nearby" - sometimes on the same

highland allotment. This was the case in all locations studied except for the LB2 of the RB21 of D1 North canal (tail) of PSS. In this area, the majority of households had purchased allotments from the original settler, or taken over abandoned allotments. One highly educated woman residing in this area (a purchaser) stated that, in her opinion, this location was not even considered part of the PSS colony due to the lack of attention and neglection by officials. Women from this area reported that they turned to the Grama Sevaka for assistance in solving problems because of the lack of community cooperation and cohesion. In other parts of the colony, attempts were originally made to relocate settlers from the same villages together. While this can generally be observed in a overview of the colony, some of the older women remarked that there was still too much "mixing" of traditional castes, and different villages for their satisfaction. Younger women generally seemed more inclined to view the existing settlement and neighbors as their community, with less reference to the original village.

Overall, the preference of the majority of women was to remain in the colony. A few preferred to move to a new settlement (notably Madura Oya), some of the older PSS women wanted to return to their original village, and a few expressed the desire to relocate out of the area - either to a city for jobs, or the Middle East for work.

Table 57. Preferences of PSS Respondents for Living Location, Tenure, and Crop Cultivation. (n=98)

Crop		Location		Tenure	
paddy only	58	present colony	78	cultv own fields	30
paddy/other crops	30	new colony	8	cultv/lease-in	30
other crops only	1	old village	7	cultv/lease-out	3
no response	9	new location	3	lease-out fields	8
		no response	2	business/service	3
				no response	24

Regarding tenure preference, most women responded that they preferred to cultivate all of their own fields, and/or to lease-in additional fields for cultivation. Some preferred to either lease-out a portion or all of their fields, or to operate a business or service instead of farming. The rather high number of women failing to respond to this question may be partially due to the hesitency to reveal leasing arrangements. Legal restrictions do exist on the leasing, mortgaging, transfer or subdivision of the original allotment.

Table 58. Preferences of Giritale Respondents for Living Location, Tenure, and Crop Cultivation. (n=50)

Crop		Location		Tenure	
paddy only	35	present colony	48	cultv own fields	18
paddy/other crops	13	new colony	1	cultv/lease-in	13
other crops only		old village		cultv/lease-out	2
no response	2	new location	1	lease-out fields	3
		no response		business/service	2
				no response	12

The preference for paddy cultivation was predominant, with 30% of the PSS women interested in agricultural diversification. This respresented an increase over the 20% currently cultivating another crop in addition to paddy. On the other hand the 26% of Giritale women interested in crop diversification would actually result in a decrease from the number of households currently cultivating other field crops (34%).

SUMMARY OF FINDINGS

Demographic Data

Due to the increasing age of the settlement schemes, a large number of second or third generation descendants, as well as the original settler family were present. Therefore, the interviews included both wives or widows of settlers, and daughters or daughters-in-law. The PSS sample included 26% widowed households, and 32% of the Giritale sample consisted of widowed households.

The educational level of women on PSS averaged six years of schooling, compared to four years of schooling on Giritale. In addition, the percentage of women with no formal education on PSS was only 16%, compared to 36% for Giritale.

Population pressures on land were considerably higher on PSS than Giritale; with 60% of the highland allotments occupied by more than one family compared to 46% on Giritale. Thirty-four percent of the households on PSS had one or more families occupying the field allotment, compared to only 16% of the households on Giritale.

Farm System

Approximately half of the women interviewed on PSS and Giritale reported that they were engaged in agricultural work on a regular basis. Even those women involved primarily in housework assisted with field work during transplanting and harvesting.

Activities of paddy production involving the greatest female involvement included:

- germinating seed paddy
- transplanting paddy seedlings
- manual weeding of paddy
- harvesting paddy
- supervising field laborers

Activities of paddy production involving the least female involvement included:

- land preparation
- use of agrochemicals and fertilizers
- care of the paddy seedling nursery

Of particular note, is the finding that the total female involvement in water management activities ranged from 11-16% for paddy production, to 33% for water management activities associated with other field crop production.

A small percentage of women (less than or equal to 10%) were involved in almost all activities associated with paddy production on PSS and Giritale. This was a diverse group consisting of wives, widows, daughters, and daughters-in-law.

Outside contract labor crews of women for transplanting were commonly employed in PSS, but transplanting labor on Giritale was mainly provided by family and local females.

Activities of other field crop production were generally performed by both men and women working together. The activities of other field crop production involving the greatest female involvement included:

- planting seeds and scaring birds
- transplanting seedlings
- weeding and harvesting

Activities of other field crop production involving the least female involvement included:

- forming seedbeds
- selecting seed
- use of agrochemicals

Female involvement in nursery care, application of agrochemicals and fertilizers, water management, and post-harvest crop care were greater for other field crops than similar activities for paddy production. This may be partially a result of the smaller extent of other field crop cultivation, a more intensive level of labor required, a dependance on family labor, and the manual cleaning of other field crops (compared to the mechanization of paddy threshing and cleaning).

Twenty-two percent of the women on PSS reported that they were engaged in off-farm agricultural work, compared to 36% on Giritale. Women involved in agricultural wage labor totaled only 8% on PSS compared to 26% on Giritale. Other forms of off-farm agricultural labor included attam (exchange labor), 13% on PSS and 24% on Giritale, shramadana (volunteered work) performed by two women on PSS and one on Giritale, and one women engaged in chena (shifting rainfed agriculture) on PSS.

In approximately 30-65% of the households on PSS and Giritale, decisions were made exclusiviely by males alone. However, in 20-45% of the households, shared decision-making between both male and female family members was reported. Farming decisions made by females alone accounted for approximately 10% of the households on PSS, and up to 20% of the households on Giritale.

Farming decisions most often involving women included:

- determining the acreage to lease-out or cultivate
- obtaining loans or pawning articles for cultivation
- determining the frequency of manual weeding
- determining the time of harvest
- crop marketing decisions (except on Giritale)
- management of cash income from the harvest

In 20-24% of the households taking loans or pawning for cultivation needs, the decisions were made by women alone. This may be related to the fact that many women (especially widows) were probably the technical title holder, or legally recognized as the household head. Also, the fact that one of the pawned items is often the women's gold jewelery probably increases the participation of women in this decision.

Farming decisions least often involving women included:

- crop selection
- use of agrochemicals and fertilizers
- solving agricultural problems

The main source of agricultural information for women was through traditional experience, her husband, and neighbors. Although 23-24% of the women on PSS and Giritale reported contact with the agricultural extension staff, it was felt that this is a somewhat inflated figure due to the misconception of some women that the Vel Vidane and Colonization Officer represented agricultural extension staff. A significant number of women (91% on PSS and 58% on Giritale) also cited mass media such as the radio, newspapers, television, and pamphlets as a source of agricultural information. The smaller figure from Giritale may reflect the lower educational level, economic conditions, or availability of items.

Approximately 80% of the women on PSS and Giritale expressed interest in receiving information on various topics including: high yielding varieties of paddy; pest, disease, and weed control; animal husbandry; subsidiary crops; water management.

Approximately 90% of the women interviewed on PSS and Giritale reported specific agricultural problems for the 1985 Yala season. On PSS the problem ranked as "most serious" was related to insufficient water for field irrigations, while on Giritale the cost and availability of agricultural inputs was ranked most serious. Overall, the women on PSS ranked pests, diseases, yields, and weeds, followed by water problems (excesses of water were mentioned with about the same frequency as deficiencies of water), and agricultural inputs as constraints to the farm system. While these three subjects were also ranked as the overall top three constraints by women on Giritale, the order was somewhat different. Pest, disease, yield, and weed problems ranked first overall, followed by agricultural inputs, and water problems. Water problems mentioned by women on Giritale also consisted of both water excesses and deficiencies in about the same frequencies.

Solving agricultural problems was almost exclusively the responsibility of male family members. Only two cases on both PSS and Giritale were identified where women were involved in seeking solutions to agricultural problems. Generally, either the Vel Vidane or the Agricultural Extension Officer (KVS) was contacted. On both systems, only about half of the women reporting problems felt a satisfactory solution was attained.

Domestic System

Although women were primarily responsible for most of the household activities, male family members were noticeably involved in firewood collection and purchasing food. These activities involved traveling outside the neighborhood and women were more constrained by time and travel requirements than men (with bicycles and tractor carts).

Most households obtained domestic water from nearby wells on the highland, but two households in both PSS and Giritale cited a nearby irrigation channel as the source of their domestic water. On PSS, 55% of the wells were concrete lined, compared to only 26% on Giritale. One third of all women on PSS complained that they had some difficulty with their wells during Yala. The most common complaint being the low water level which decreased the quality of the well water. A few wells actually dried up during the latter part of Yala, requiring an alternate source of domestic water. Similar complaints were reported by 52% of all women on Giritale. It was noted on both PSS and Giritale that a higher proportion of households located in the tail of the irrigation system reported well problems.

The majority of households either collected firewood near the homestead, or purchased firewood from cart vendors traveling throughout the neighborhood. However, 18% of the PSS households and 26% of the Giritale households indicated that they were required to travel distances of two or more miles to procure firewood. Generally, every few months (once a season) several family members (both males and females) would travel by cart to the jungle areas to collect firewood. Whereas most households on PSS rented either animal or tractor carts, those on Giritale provided their own transportation.

During the Yala season, home gardening is limited due to insufficient rainfall and the absence of a water delivery system to the highlands. Only 28% of the households on both PSS and Giritale were gardening on the highland. As an alternative, an additional 15% on PSS and 20% on Giritale were growing vegetables on the periphery or bunds of the irrigated fields. These small plots were cared for by both male and female family members, and generally limited to home consumption with only occasional sales.

On the other hand, where water could be obtained from drainage or irrigation channels, a highland crop was usually cultivated. Twenty-nine percent of the PSS households and 20% of the Giritale households were engaged in cultivating the highland. The care of the crop was generally the responsibility of both male and female family members. While the highland crop was also used for home consumption, the primary objective was sales. On PSS the preference for cultivating paddy on the highland was dominant, but on Giritale, vegetable and chili cultivation exceeded that of paddy. It may be that most of the highlands in the Giritale scheme are not able to access irrigation water for the highland as easily as those on PSS.

Almost all of the highlands on both PSS and Giritale cultivated permanent tree crops. By far, the most common being coconut, followed by mango, jackfruit, banana, and others. There appeared to be little care associated with these trees, and no cases were noted where propagation, cultivation, or marketing were activily pursued. While the majority of women stated that the products were used only for home consumption, 26% on PSS and 18% on Giritale reported occasional sale.

Eighty percent of the households on PSS were maintaining livestock, compared to 70% on Giritale, the most common being buffalo, cattle, and poultry. The care of these animals was generally relegated to males, but some women also assisted with animal care as well as cutting fodder. No large scale animal husbandry endeavors were identified, with animals used only for land preparation, or products limited to family use.

Overall, discussion and shared decision-making by both male and female family members was the most common process by which decisions in the home were made. Decisions with the greatest total femal participation included:

- schooling of children
- pawning articles
- determining gifts/obligations to relatives and temple
- day-to-day expenditures
- purchase of textiles and clothing

Decisions with the lowest female involvement included:

- sale or purchase of animals
- taking or repaying loans (other than agricultural)

Traditional experience and knowledge passed down within the family were the major sources of domestic information for women. Twenty-three percent of the women from PSS had participated in training classes, compared with only 14% from Giritale. Most of these involved sewing, weaving, and handicrafts. However, women most often requested information on subjects such as food preparation, health and nutrition, and income generating activities.

Women identified the inaccessibility of water to the highland as the single most serious constraint to highland productivity on both PSS and Giritale. In addition, rocky and infertile soils, and damage by animals (both domestic and wild) were of considerable concern.

Income and Expenditures

Although the primary source of income was the irrigated field crop, other sources of income generally existed. Seventy to eighty percent of all households on PSS and Giritale identified supplemental income sources. A significant contribution from the casual wage labor or off-farm job of a family member was common on both PSS and Giritale. Although difficult to quantify, one of the most often cited sources of income included the sale of fruits, vegetables, coconuts, or crops cultivated on the highland.

Women interested in increasing their income responded with various ideas. On PSS most women perceived of increasing their income mainly through increased paddy production (either higher yields, inputs, or increased acreage). A significant number from PSS also named the cultivation of subsidiary crops. On Giritale, interest was more diverse; including sewing and crafts, off-farm jobs, animal husbandry, and paddy production.

The majority of household expenses revolved around family subsistence and agricultural input needs for both PSS and Giritale. These priorities were followed by health and medical needs and children's education. While 20% of the PSS respondents ranked loan repayment as one of their top three expenses, only 10% were concerned with this subject on Giritale. Interestingly, subjects such as savings, house construction or repair, entertainment and gifts, and business expenses which were minimally included by PSS women, were absen from the priorities of Giritale women.

If a large amount of cash (such as a lottery winning) were available, the spending preferences of women on both PSS and Giritale were related to home construction, improvement, or repair. Women from PSS also added the purchase or leasing-in of lands, savings, and agricultural equipment to their choices. Women from Giritale preferred to settle loans or mortgages, educate children, or invest in agricultural equipment as additional choices.

Although the management of family cash was primarily the responsibility of male family members, 32% of the PSS women and 18% of the Giritale women indicated that cash management was shared between male and female family members. A surprisingly high number of women (22% from PSS and 34% from Giritale) reported that they alone were responsible for household cash management. One interesting method of managing household expenses related by a large number of women, revolved around borrowing small sums of cash from both neighbors and nearby boutiques. This may be a result of the overall limitations of the family budget during most of the cultivation season, or reflect the unavailability of ready cash to women themselves.

Women obtained cash for their own personal use on PSS primarily throughthe sales of fruit, vegetables, coconuts, animal products, and sewing or crafts. Women from Giritale primarily relied on their own wage labor earning, but also sold fruits and vegetables to obtain cash for personal use.

While most of the purchases related to the farm operation were conducted by males alone, the involvement of women increased when major items and home furnishings were purchased. Women were primarily responsible for purchasing textiles, clothing and cooking utensils, but the marketing for food and daily needs was often assumed by males.

Community Participation

Twenty-five percent of the PSS women were involved in a local community organization or society, compared to 32% of th Giritale women. The most popular appeared to be Kantha Samith the women's division of the Rural Development Society. Some c the projects and activities cited by women members included: setting up a sewing center and organizing sewing classes, establishing pre-schools, granting loans to members for paddy cultivation, constructing latrines, and various community shramadana activities. Although the Rural Development Society members are generally male, membership of women is not exclude and a few women on both PSS and Giritale were members of the local RDS. Activities of this society included granting agricultural and house construction loans to members, obtainin tubewells, construction of houses, and various shramadana activities in the community.

By far, the most common forms of community interaction wer the informal groups which revolved around daily activities. A large number of women belonged to temple or religious groups involved in religious ceremonies, shramadana, and pilgrimages. In addition women would get together as a group to perform shramadana or attam, for road and channel repair, community work, agricultural work, and for labor at the cultural triangl preservation site.

Although women rarely participated in Kanna (pre-cultivation) meetings, one woman from PSS and four women from Giritale were identified who had attended the 1985 Yala meeting. Later, five women from PSS and one woman from Girital reported that they had attended the 1985-86 Maha Kanna meetings. One woman from PSS also indicated that she was a member of a local water user group, although the majority of women either claimed that no such groups existed in their area, or were unaware of these groups. Women related that the usual method of solving water-related problems was through informal means, usually involving the local Vel Vidane. Satisfaction with this method was highly variable and seemed to depend upon the individual efforts of the particular Vel Vidane. As a result, approximately 65% of the women from both PSS and Giritale expressed the need for a group with authority to solve irrigation problems. In addition, the majority of these women were willing to join such a group.

Settlement Experience

Overall, 67% of the PSS women and 74% of the Giritale women expressed satisfaction with their colony scheme. However, only 10-11% found colony life "very" satisfactory, while 16-19% expressed dissatisfaction. Among those who were satisfied or very satisfied, land ownership was judged to be the prime consideration followed by earning a good income. Dissatisfied women from PSS related this primarily to poor facilities (such as shops, schools, markets, and health care), problems of water delivery (both fields and highlands), and economic difficulties. On the other hand, women from Giritale

largely complained about their poor income and economic conditions from the combination of mortgaging, agricultural input costs, and unavailability of loans.

Women from both PSS and Giritale suggested that the delivery of water to the highlands would be a substantial improvement of their colony. Additionally, delivery of electricity, improved roads and transportation, and employment opportunities were mentioned.

Although both PSS and Giritale schemes consisted of a diverse mixture of settlers from various locations, support in the form of relatives and neighbors during times of crises was commonly reported. This was generally the case for all of the sites investigated, with the exception of the tail location of PSS. At this site, women reported very little community cooperation or cohesion. In this area, the majority of households had either purchased attotments from the original settler or encroached on abandoned allotments.

The majority of women from PSS and Giritale preferred to remain in their colony, but a few indicated they would like to relocate; either to a new settlement, the old village, or a town. As expected, the preference of women on both PSS and Giritale was to cultivate their own fields or to lease-in additional lands. While the preference for paddy cultivation was predominant, 31% from PSS and 26% from Giritale were interested in crop diversification.

CONCLUSIONS AND RECOMMENDATIONS

During the 1985 Yala season, a component relating specifically to women was incorporated as part of a larger, interdisciplinary baseline study of the Parakrama Samudra and Giritale irrigation systems. The objectives of this component were the identification of the various interactions between farm women living in the settlement scheme, and the irrigated agricultural system on which they depend for their existence.

Three field surveys, consisting of interviews with 98 PSS women and 50 Giritale women, were conducted during the 1985 Yala season. Based on these investigations, the major conclusions follow:

Women were found to be active participants in the irrigated agricultural production system. Approximately half of the women surveyed were physically engaged in agricultural work on a regular basis. Except for strenuous land preparation activities and agrochemical use, women were involved in the majority of agricultural tasks. The greatest female involvement was found to be in transplanting, weeding, and harvesting activities. A significant female involvement in water management activities was also noted. The total female involvement ranged from 11-16% for water management activities associated with paddy production, to 33% for water management activities associated with other field crop production.

In addition to physical participation, women were also actively involved in the operation of the farm system through decision-making and management. A significant number of households (20-45%) shared decision-making between male and female family members for a number of important agricultural matters. Farming decisions made by females alone (primarily widows) accounted for approximately 10% of the PSS households and up to 20% of the Giritale households. In fact, one of the decisions with the highest level of female involvement related to acquiring loans or pawning for cultivation needs. In 20-24% of the households engaged in this activity, the decision was made by women alone. This was probably a result of the colony age, and the significant number of widows inheriting legal title to the land. The PSS sample included 26% widowed households, while 32% of the Giritale sample was composed of widowed households. Although the day-to-day operation of the farm may have been relegated to sons or sons-in-law, a high degree of influence in farm decision-making was retained by these women. Widowed households have unique problems and needs regarding farm management, and require representation in farmer organizations.

Aside from activities on their own farms, 34% of the PSS women and 48% of the Giritale women were also involved in various off-farm activities. These activities consisted mostly of casual wage labor, attam (exchange labor), and shramadana (volunteered labor). The majority of these activities were either associated with agricultural work or community projects such as road, bund, and channel repair and construction.

Because of the close contact between women and the irrigated agricultural system, women were able to provide valuable insight concerning the constraints and operation of the farm system. Approximately 90% of the women from PSS and Giritale reported specific agricultural problems for the 1985 Yala season. Overall, problems associated with water delivery; pests, disease, yields, and weeds; and economic costs of agricultural inputs, were most often mentioned as constraints to agricultural production. Solving these problems was almost exclusively the responsibility of male family members. Only four cases were noted where women were involved in seeking solutions to agricultural problems. Generally, either the Vel Vidane or the Agricultural Extension Officer (KVS) was contacted. However, only about half of the women reporting problems felt that a satisfactory solution was attained by these methods. It appeared that the operating constraints of the Agricultural Extension Service made it difficult for cultivators to expect to meet the estension officers in the field. Instead, those with problems most often traveled to the extension office to seek agricultural information and advice. These kinds of time and travel constraints undoubtedly contributed to the low level of female participation in solving agricultural problems.

Eighty percent of the PSS and Giritale women expressed interest in specific agricultural topics such as: high yielding varieties of paddy; pest, disease, and weed control; subsidiary crops; water management; and agrochemicals. However, the main source of agricultural information for women was through traditional experience and informal means (the husband and neighbors). Although women do require, and have requested agricultural information, the present Agricultural Extension System appears inadequate to address their needs. The Agricultural Extension System is also charged with providing home gardening information, but there were no reports from women concerning this activity. However, a significant number of women mentioned the mass media, such as radio and newspapers, as a source of agricultural information. It may be possible that the fairly high level of female education noted in the survey, combined with the accessibility of radio and newpapers, could be used to extend agricultural information to women.

Most of the households obtained domestic water from nearby wells on the household, but four women cited a nearby irrigation channel as their source of domestic water. Thirty percent of the PSS women and 52% of the Giritale women reported difficulties with their wells during the Yala season. The most common complaint was the poor water quality which resulted when the well level dropped. However, a few wells actually became dry during the latter part of the Yala season, requiring an alternate source of water. Most of these wells appeared to depend upon surface water (tanks, channels, and lakes) for recharge. Further hydrological study is needed to determine the interaction of the highland well and the irrigation system, as well as to determine the impact of irrigation system rehabilitation on the domestic water supply. In some instances, the highland well might also be used as a source of water for cultivation, but this would require further study.

During the Yala season, home gardening is limited due to insufficient rainfall and the absence of a water delivery syste to the highland. Only 28% of the PSS and Giritale households were gardening on the highland. These small plots were cared for by both male and female family members, and were generally limited to home consumption, with only occasional sale. In fact, only two women indicated that they were able to meet the family meal requirements through their gardens. In all other cases, women purchased at least some vegetables, with 68-76% of the households exclusively purchasing vegetables for family meals during the 1985 Yala season. The availability of water, poor soils, animal damage, and the fragmentation of the highlan were all important constraints to highland productivity cited b women. On the other hand, when highlands were located in close proximity to the irrigation channel water was often tapped for the cultivation of paddy, chili, tobacco, or vegetable crops. In fact, 30% of the PSS and 20% of the Giritale highland allotments were extensively cultivated (primarily for sales, rather than home consumption). While the farm household may realize definite benefits from such an endeavor, it is presentl incompatible with the design of the irrigation sytem and undoubtedly has a significant effect on the delivery of irrigation water to the fields. Any redesign, rehabilitation, or improvements planned for the irrigation system should also consider this situation. While all of the original expectations for the highland may not be possible in all locations, the highland still retains a tremendous potential for production. Alternative crops and cultivation techniques should be explored, tested, and demonstrated for improving highland productivity.

Although the primary source of income for the farm family was the irrigated field crop, other sources of income generally existed. Seventy to eighty percent of all households identifiec supplemental income sources. A significant contribution from the casual wage labor or off-farm job of a family member was common. Although difficult to quantify, one of the most often cited sources of income included the sale of fruits, vegetables, coconuts, or crops cultivated on the highland.

Generally, individuals earning cash contributed all or part of their earnings to the family. In many households the family cash was managed by males; however, in 33% of the PSS households and 18% of the Giritale households women reported that this was a responsibility shared between male and female family members. A surprisingly high number of women (22% from PSS and 34% from Giritale) reported that they alone were reponsible for household cash management. Women related that they obtained cash for family needs through a variety of sources. Most often, the husband, son, or other family member provided cash. Another source of household cash for women appeared to be loans from neighbors or local boutiques. The use of borrowed cash for everyday household expenses may be a result of the overall limitations of the family budget during most of the cultivation season, or simply reflect the unavailability of ready cash to women themselves. Women obtained cash for their own personal use from their own wage labor earnings, and sales of fruit, vegetables, coconuts, animal products, and sewing or crafts. In

addition, a few women either owned and operated small bakery or boutique businesses, or provided services such as agricultural equipment rental and cart transport.

Women were active in their community in various societies and groups. The most popular society was the Kantha Samithi, women's division of the Rural Development Society. Activities cited by women members included: setting up a sewing center and organizing sewing classes, establishing pre-schools, granting loans to members for paddy cultivation, constructing latrines, and other community work projects. A few women were also members of the Rural Development Society, and mentioned activites such as granting loans for agriculture and house construction, obtaining tubewells, and construction of houses. The most common forms of community interaction were through informal groups. In addition to daily activities, women would get together as a group to perform shramadana (voluntary labor) or attam (exchange labor) for agricultural work, road and channel repair, and community projects.

Women rarely participated in Kanna (pre-cultivation) meetings, but five women reported attendance at the 1985 Yala meeting. Latter in the season, six women indicated that they had attended the 1985-86 Kanna meeting for the Maha season.

Although the majority of women claimed that water user associations did not exist in their area, or were unaware of these groups, one PSS women reported that she was a member of a local water user group. Women related that the usual method of solving water-related problems was through the Vel Vidane. Satisfaction with this method was highly variable, and as a result, 65% of the women expressed the need for a group with authority to solve irrigation problems. In addition, the majority of these women were willing to join such a group. The participation and interest of women could increase the efficiency and effectiveness of such groups.

Overall, 67-74% of the PSS and Giritale women expressed satisfaction with their colony scheme. However, only 10-11% found colony life "very" satisfactory, while 16-19% were dissatisfied. Among those who were satisfied or very satisfied, land ownership was judged to be the prime consideration, followed by earning a good income. Dissatisfied women related this primarily to either poor facilities (such as shops, schools, markets, and health care) or their poor income and economic condition. Women suggested that the delivery of water to the highlands would be a substantial improvement to their colony. Additionally, delivery of electricity, improved roads and transportation, and employment opportunities were mentioned.

APPENDICES

IMPLICATIONS FOR THE IRRIGATION SYSTEMS MANAGEMENT PROJECT

In Sri Lanka, the development of new irrigation systems and the improvement and rehabilitation of old systems is a prime target of agricultural development planning. Large irrigation systems, associated with resettlement projects, have been constructed to extend and increase the agricultural production of the Dry Zone area. However, the operation of many of these schemes has been less than optimal, and the anticipated results have not always been realized. As a consequence, shifts in institutional policy and new research and development programs have resulted. These new policies emphasize the development of alternative strategies for improving the productivity and performance of established and future systems.

The Sri Lankan government is currently seeking to identify and prioritize constraints of irrigation systems scheduled for improvement and rehabilitation with USAID financial assistance. One such USAID activity is the Irrigation Systems Management Project (ISMP) scheduled for 1986. The major goals of this project are:

- to expand food production,
- increase employment opportunities, and
- raise the standard of living

for farm families on selected irrigation schemes in the Dry Zone through the improvement and rehabilitation of existing irrigation systems. Although physical improvements to the existing irrigation systems are important considerations, various socio-economic efforts are also included in the ISMP design. A complete description of the objectives and design plan for the ISMP is contained in Skogerboe et. al, 1984.

With increasing recognition of women's active participation in agricultural production, and development programs aimed at increasing agricultural production through irrigation, the subject of women's roles in irrigated agricultural systems becomes important. For this reason a component relating specifically to women (WID) was included as part of a larger research project. The Diagnostic Analysis (DA) Project is an interdisciplinary research effort, gathering baseline information on selected irrigation systems scheduled for improvement in the Polonnaruwa District. The overall objective of including the WID component into the DA Project was to identify the interaction of women with various aspects of the farm, household, and community within particular irrigation systems. A better understanding and appreciation of women's involvement serves to expand the interdisciplinary nature of the DA Project, as well as provide information which may assist the ISMP in making decisions regarding the implementation of its activities. Programs such as the ISMP which incorporate and are sensitive to the needs and desires of women may help to determine the ultimate success and productivity of the farm, household, community, and nation.

The physical and socio-economic activities planned by the ISMP are designed to result in improvements in the management of both the main irrigation system and on-farm system. In turn, a more adequate, equitable, and reliable delivery of water throughout the project sites may be obtained. If this can be accomplished, some expected changes may occur, including:

- an increase in field acreage cultivated,
- water delivery for highland cultivation,
- increased crop yields,
- increased transplanting over broadcast seeding, and
- increased crop diversification.

These changes may then accomplish the ISMP goals of increased food production, employment, and income.

In the following discussion, an attempt will be made to address the implications of the ISMP, its activities, and resulting changes, to women in the project sites.

Present information suggests that while some additional field acreage will be brought under cultivation after the rehabilitation of the irrigation system, it will probably not comprise a significant amount. Therefore, increases in field acreages will only provide a limited potential for increasing food, employment and income.

Although not originally included in the ISMP design, the possibility exists for incorporating some areas of "highland" into the water delivery system. In some locations, the homestead allotment is situated in close proximity to irrigation channels and is not technically "high" land - outside the reach of the irrigation system. Women reported that the single, most serious constraint to highland productivity was the inaccessability of water, and suggested that the availability of water to the highlands would be considered the greatest improvement possible for the settlement colony. It has already been noted that when water is available, the homestead is almost always extensively cultivated with home gardens or a crop. In fact, 20-30% of the highland allotments on Giritale and PSS were under crop cultivation (paddy, chili, tobacco, or vegetables) during the 1985 Yala season. The major source of water for many of these highland crops was the irrigation channel. Although the original design of the irrigation system did not include the supply of water for highland cultivation, it would appear that any redesign, rehabilitation, or improvements planned by the ISMP should consider the present situation.

While it is recognized that the subject of water delivery for highland cultivation is controversial, significant benefits could result. The combination of sales from fruit, vegetables, or a crop cultivated on the highland was the most common means cited in the WID study for supplementing family income. Additionally, women reported that their major method of obtaining personal cash was through the sale of fruits, vegetables, or coconuts. Due to the limited extent of highland cultivation, labor supplied by the family is sufficient

However, if highland cultivation is expanded, or more labor intensive crops such as chili are cultivated, a demand for local labor (including women) could result. In any event, if a reliable source of water were available for highland cultivation, it would significantly add to the goal of the ISMP for increased food production and income, while contributing to the health and nutrition of the farm family.

Perhaps a more significant contribution towards the ISMP goals of increased food production and family income may be through the increase in crop yields. Crop yields may be raised by various improvements in the management of both the irrigation and on-farm systems.

Certainly, the rehabilitation or construction of structures throughout the irrigation system will improve the control and delivery of water by the irrigation system, an important key to better farm management. Additionally, the training of both administrative and field level staff in methods of operation and maintenance, as well as in monitoring and evaluation, can contribute to better irrigation system management practices. This training and education also offers an opportunity for the involvement of women. Contrary to the belief of many, women professionals and local officers do exist in the various disciplines necessary for operation, maintenance, monitoring, and evaluation activities. Their participation would not only benefit them professionally, but also assist in improving their job performance, contributing towards the better management of the irrigation system.

At the farm level, one of the most important factors to improving management practices is the incorporation of the cultivator (whether male or female) into the activities proposed by the ISM Project. In reality, it is often this variable which determines the success or failure of rehabilitation and improvement projects. The cultivator should be included through the extension of knowledge and training in better on-farm management practices, and also as an active participant in management decisions and problem solving. In order to improve their performance at both levels, cultivators should be specifically targeted through extension efforts as well as water user associations.

Information and training in better on-farm management practices must be provided to those individuals engaged in cultivation activities, including women. A significant proportion of the WID sample (26% for PSS and 32% for Giritale) included widowed households. Although the active participation of these widows remains uncertain, a high degree of influence in farm decision-making was reported. These households should not be excluded from activities aimed at improving the management capabilities of the cultivator. The WID study also noted that approximately half of all women interviewed on PSS and Giritale were engaged in agricultural work on a regular basis, with a high degree of female participation in many field activities. Of special interst is the finding that the participation of women in water management activities at the field level was

found to range from 10-16% for paddy production and from 32-33% for other field crop production on PSS and Giritale schemes.

In addition to the physical activities performed by women during cultivation, a fairly high level of participation by women in farm decision-making was also reported. In approximately 20-45% of the households on PSS and Giritale, shared decision-making concerning the farm operation between both male and female family members was cited. Farming decisions made by females alone accounted for approximately 10% of the PSS households, and up to 20% of the Giritale households. In the households where farming decisions were made solely by women, a majority were either widowed or the husband was absent or unwell. If women are not consciously included in training and educational activities, their omission may result in an overall decrease in efficiency and effectiveness for the ISM Project.

Culturally, there do not appear to be serious obstacles to the participation of women in training or management groups with males. However, even when women are physically present, their participation may be somewhat submissive, with respect to male members in a group. The actual involvement of women in either training or water user associations may be assisted by various means, but may be largely dependant upon the individual personality of the woman herself. Although not common, the WID study did encounter women from the irrigation schemes who were very out-going and active in community leadership. The encouragement and inclusion of these women in various activities would not only serve to represent women's interests, but also provide a role model for other women in the community.

Although approximately 80% of the women from PSS and Giritale expressed interest in obtaining specific agricultural information, their sources were primarily limited to either traditional experience or informal means such as the husband, neighbors, or other farmers. Through various questions and discussions, the WID study noted that certain constraints existed within the agricultural extension system. Field level staff are responsible for contacting cultivators over a very extensive area. In addition, a multitude of logistical as well as administrative problems combine to decrease the effectivity of these extension workers. Due to this, most households responded that when agricultural problems arose, a family member would travel to the extension office for advice. Almost exclusively, this was a male family member, as the difficulty of traveling out of the neighborhood limits women. Presently, the agricultural extension staff appear to be over-extended, which may make additional duties and responsibilites such as home gardening or extension directed specifically to women difficult.

A major activity proposed by the ISMP as a means for improving both the irrigation system management and on-farm water management is the formation of water user associations. Through this effort, cultivators will have increased participation and responsibility for management.

Approximately 65% of the women interviewed from PSS and Giritale expressed the opinion that a group was needed in their area to deal with problems concerning irrigation water, and the majority of these women stated that they would be willing to join such a group. In addition, the WID study identified 26% of the PSS sample and 32% of the Giritale sample as widowed households. These households have particular problems and unique needs relating to farming that generally are not recognized due to lack of representation. Special efforts will be required to ensure that water user associations formed by the ISMP include adequate representation of these households. ISMP design plans include the use of Institutional Organizers (IO's) to form water user associations. Although women are not specifically planned for inclusion as IO's, neither are they excluded. An effort to include women as IO's may improve the representation of women in water user associations, but certainly does not guarantee this. To be truely effective all IO's (whether female or male) should be sensitized to the special requirements of widowed households and the importance of their inclusion in water user associations.

If through improved irrigation system management, a more reliable and equitable water delivery results from rehabilitation efforts, there may be a preference of cultivators to shift from broadcast seeding to transplanting. Under some circumstances, the transplanting of paddy has been associated with increased yields, although not guaranteed. However, an increase in transplanted areas would certainly result in a demand for female labor, since transplanting is almost exclusively a female activity. However, the shift to more transplanting may be limited by various factors, such as economic constraints, limited local labor sources, and the need for increased management on the part of the cultivator. It appears that the demand for transplanting labor currently exceeds the local female labor supply in PSS, as outside contract crews are the primary source of transplanting labor. Any benefit realized from an increase in transplanting would probably involve women from outside (Up-Country, Wet Zones) rather than the local farm women. On the other hand, in the Giritale scheme, transplanting is primarily performed by local women. This may be due to a combination of smaller holdings, and economic constraints, either of which may limit the extent of transplanted area.

Presently, a strong preference for paddy cultivation predominates in both PSS and Giritale, limiting crop diversification. The difficulty of precise water control probably also relates to the low crop diversity presently observed in the area. In addition to better water management practices, other efforts such as extension and training would also be required to increase crop diversification in this area. An increase in crop diversification, with more intensive cultivation requirements, would provide a demand for local agricultural labor. A raise in the household income could also be expected, based on current market prices. Since the WID study noted that women were actively engaged in most activities associated with other field crop production, it may be argued

that local women as well as men could benefit as agricultural laborers. Currently, local labor (both male and female) meets the demand for the limited production of other field crops. It is doubtful that outside contract labor would be practical, due to the continuity of labor intensive activites throughout the entire growing season with crops such as chili. Therefore, the local labor supply may limit crop diversification in this area.

Generally, the designs and plans of the ISMP suggest that women are expected to benefit along with other household members from income increases. While the WID study noted the substantial involvement of women in the management of family resources, there were other questions raised about the actual control of cash within the family by women. The majority of women managing household expenses reported that they were dependant upon husbands, sons, or small loans from neighbors and boutiques for cash. This may indicate a lack of personal income sources, or direct access to family cash. However, in cases where women were engaged in casual wage labor, a much greater control over household cash was common. While generally, the cash earned by individuals within a family is pooled for the benefit of the entire family, observations during the WID study noted a few cases where mismanagement of family cash for liquor and gambling occurred. In these circumstances, the expected increase in household income would confict with the goal of improving the well-being of the entire farm family.

The rehabilitation activities of the ISMP may have an effect on the domestic water supply in the settlement schemes. The majority of domestic water is obtained from highland wells on PSS and Giritale that are partially dependant upon recharge from the irrigation system. During the latter part of the Yala season, when irrigation issues are decreased or terminated, women complained of inadequate water levels in their highland wells. Fifty-two percent of the women interviewed on Giritale reported well problems during Yala, while 30% of the women from PSS cited similar difficulties. If rehabilitation improvements decrease the seepage presently occurring from the irrigation system, particular efforts to ensure adequate domestic water during the Yala season may be required.

The ISMP also offers the opportunity for applied research studies to be conducted. A number of possible topics exist which should be considered for future investigation.

There has never been an adequate hydrological evaluation of the highland wells, which is the primary source of domestic water for the farm family. Very little is actually known about the dependance of these wells on the irrigation system. There appears to be a definite relationship between surface water sources such as tanks, rivers, and channels and the reliability of the highland well. In some situations the potential of using the highland well as a source of water for the home garden or highland crop also exists. Investigations regarding this topic could help to clarify the dependance of the highland well on the irrigation system, as well as predict the possible effects of rehabilitation on domestic water supply.

Another topic of concern relates to the extension and training of women involved in agriculture. While women do require, and have repeatedly requested, agricultural information, the present extension system is undoubtedly inadequate to deal with additional responsibilities. As a supplement or alternative, the mass media may perhaps be an area through which women (as well as men) might be effectivily reached. A significant number of women (91% from PSS and 58% from Giritale) acknowledged that they had obtained agricultural information from sources such as the radio, newspapers, television, or pamphlets. The Agriculture Department and the Mahaweli Authority have a number of radio programs relating to agriculture, but other specific means to address women on agricultural subjects should be considered. Perhaps a small pilot project could determine the types of information requested by women, and establish the feasibility and effectiveness of such a program.

Since the inception of these settlement schemes, criticism has been directed towards the design, planning, and implementation of the homestead allotment. In effect, the highland allotment was asked to function as a gangoda (village garden) similar to those of the Wet Zone, from which many of the settlers originated. The highland allotment was intended to provide fruit, vegetables, and grains (for both home consumption and sale), pasturage or fodder for livestock, and firewood. Unfortunately, due to geological, hydrological, and biological constraints, the development of these allotments in the resettlement schemes has been a major disappointment. While all of the intended uses may not be possible in all locations, the highland still retains a tremendous potential for production. The use of small hand pumps from the highland well, composting, mulching, and alternative crops should be considered. The combination of applied research and demonstration plots relating specifically to improving the productivity of the highland could result in a significant impact on both food production and family income.

GLOSSARY

Ande	A form of sharecropping, with payment either in cash or crop
Attam	Exchange labor
Chena	Rainfed, shifting cultivation
DA	Diagnostic Analysis (Project)
Gangoda	Village garden, home garden
Grama Seveka	Village headman, appointed by the government and responsible to the Gramodaya Mandelaya
Gramodaya Mandelaya	Local government board composed of community leaders from various societies
ISMP	Irrigation Systems Management Project
Kachcheri	District Government Agents Office
Kanna meeting	Pre-seasonal cultivation meeting between farmers and irrigation officials
Kantha Samithi	Women's division of the Rural Development Society
Kulangana Samithi	Formal women's temple society
KVS	Agricultural field extension officer
Liyadda	Small bunded portion of a field
Maha	Wet cultivation season, extending from mid-October to late March
Pola	Local fair and market, generally held once or twice a week
PSS	Parakrama Samudra System
Purana	Old or traditional, referring to villages or residents of an area before resettlement
RDS	Rural Development Society
Sarabumi	A government sponsored, agricultural radio program.

Seettu	Shares or contributions of members are pooled, with the sum going to individual members in sequence
Shramadana	Voluntary community work
Tattumaru	Traditional practice of rotating the cultivation of the fields between family members each season
Vel Vidane	An informally appointed or elected individual who manages irrigation water from the distributary head gate to the field channel
Wee Porunduwa	A form of sharecropping, with crop payment
WID	Women in Development
Yala	The dry cultivation season, extending from mid-April to late September

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