

ANALYSIS OF WATER MANAGEMENT PROCESSES, AGRICULTURAL  
AND HOUSEHOLD ACTIVITIES BY GENDER ROLES IN  
FOUR VILLAGES, PUNJAB, PAKISTAN

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## INTRODUCTION

The purpose of the CID/WID project was to investigate the effects of water management on individuals and households in rural areas of the Punjab Province in Pakistan. Whereas females in rural areas represent 57.3 percent of the human resources available to a household as well as over one half of the individuals who expect to benefit from water usage, systematic attention needs to be paid to gender differences (Qadri and Akbar, 1980).

According to Cloud (1982) the literature is clear that distribution of costs and benefits of irrigation in any particular system are conditioned by the socioeconomic status of the household, their access to land, and the spatial features of the particular water system. What is not so clear is how the distribution is conditioned by gender. Gender-related issues of water management have only recently been addressed by project personnel. Recent work in Sri Lanka (Jayewardene et al., 1983) and India (Stanbury, 1984) has implemented methodologies for incorporating a female component into water management projects. In regards to predominantly Islamic societies, less has been accomplished.

Basic societal beliefs have made researching women's roles in Pakistan difficult. A great deal of value is placed on the segregation of the sexes which limits the effectiveness of researchers attempting to study the opposite sex. The convention of male superiority and female subordination has also resulted in an oversight and exclusion of women from government projects (Khan, Ater, and Arledge, 1984).

One aspect of Pakistani society which is particularly relevant to the role of women is the concept of purdah, or the traditional system of enforcing high standards of female modesty. This norm is accomplished by separate living spaces, restricted public areas, physical mobility

limitations, burqa (veil), early arranged marriages and general seclusion of the feminine gender. Wide variations of purdah observance exist and factors which affect the observance include income, class, place of residence, education, occupation, religious affiliation, ascriptive group membership and individual circumstances. Observance of purdah tends to increase at higher socioeconomic levels though basically all women, with the exception of beggars, servants, and peddlers, observe it to some degree (Khan, Ater, and Arledge, 1984).

Female roles and behavior are defined by Islamic law and, as such, are given divine sanction. In all social classes, a male kinsman is economically, legally, and morally responsible for the woman and thus her behavior becomes a measure of the status of her protectors (Khan, Ater, and Arledge, 1984).

Actual daily activities vary according to economic status and social and cultural norms. Studies relevant to the rural women are both scarce and quite deficient with regard to their participation in agriculture. A recent Sind study (Qadri and Akbar, 1980), however, reports that 45 percent of women's time is spent in agricultural activities. By viewing women only as non-earning "helpers" or only in their homemaking role, development planners and strategists fail to give recognition or take their essential participation into account.

Current involvement of a CID university, Colorado State University, in water management projects and specifically in Pakistan suggested the opportunity to acquire needed insights in relation to women and water management in Islamic cultures. The On-Farm Water Management Project (OFWM) (Credit 1163-Pak) was being conducted in four provinces of Pakistan funded by the Government of Pakistan and World Bank through its affiliate

International Development Agency (IDA) under leadership of Colorado State University (CSU) personnel. Other Agency for International Development (AID) funded projects were also being considered.

The selection of the Punjab province as the location of the project was based on the resources available to the researchers. Transportation, housing, assistance in identifying villages and personnel assistance were deemed most accessible in Lahore. The fact that Lahore was the home city of the Pakistani WID Fellow also was considered to be a considerable asset due to her familiarity with the area.

Pakistan has about 40 million acres of irrigated land of which about 34.5 million acres are commanded in the Indus Irrigation System. The Indus Irrigation System (or 86% of the irrigated area) is the largest irrigation system in the world. In each canal command (total 43), the lowest order command is called a chak (total 89,000) and comprises an area that varies in size from 200 to 700 acres (average 450 acres) with 20 to 50 farms. The boundaries of the chak and alignment of the communal watercourse channel or sarkari khal are established by the Provincial Departments of Irrigation. Flow in the chak distributary system which is called a watercourse, is governed by an open outlet or mogha designed to pass a discharge that self-adjusts in proportion to flows in the parent canal with planned discharges of one to three cusecs depending on size of the chak. The distribution of water within a chak is by a time rotation called warabandi with each farmer holding a specific time period (set by the Provincial Departments of Irrigation) in proportion to the size of his holdings. Flow is diverted to various branches of the watercourse by constructing earth dams or checks at junctions, and to farm fields by cutting the banks of the watercourse or katcha nuccas. The construction,

operation and maintenance of the sarkari khal channels in the chak are the responsibility of the farmers. Because of poor farmer cooperation and inadequate technical assistance, watercourses deteriorate, resulting in excessive delivery losses (Hilleman, 1985).

The Government of Pakistan (GOP) and USAID agreed to a five-year (1976-80) nationwide OFWM Pilot Project based on the research findings of the Mona Reclamation Experiment Station (MRES) and the Revised Action Program (RAP). The project was executed by the Ministry of Food, Agriculture and Cooperatives through a Federal Water Management Cell with implementation by OFWM Directorates within each Provincial Departments of Agriculture. An innovative and successful approach was the provision that the farmers would supply all unskilled labor for construction of civil works with GOP to supply all materials, technical assistance, and 50 percent subsidy for precision land levelling (PLL). The pilot project included the following:

1. Watercourse improvement with limited 10 percent hard materials lining (concrete and brick) and the remaining compacted earth banks, and concrete control structures called pucca nuccas;
2. Precision land levelling (+ or - 2 cm deviation from average field elevation); and
3. Improved water management practices on farms.

Three training institutes were established at Lahore, Hyderabad and Peshawar to give specialized training to OFWM personnel and officials of cooperating agencies. The University of Agriculture at Faisalabad offered a special four and one-half month training program for Agricultural Officers (AO) and for instructors at each Provincial training institute. All training included classroom as well as field work. The pilot project was phased out December 31, 1981 (Hilleman, 1985). An evaluation of the

pilot project in 1982 indicated that watercourse renovation under USAID assistance resulted in a 37% saving in water delivery. In order to maintain the momentum of the original AID pilot project, the GOP requested that World Bank conduct a similar three-year project (FY82-84). The OFWM project, identified above, provided equipment, technical assistance, training and 70 field teams to implement project targets.

At the time the WID Fellows were developing their proposal, it was indicated that the OFWM project would be extended beyond the December 1984 completion date to June 30, 1985. Completion of the CID/WID project in the summer of 1985 would contribute to the final results as well as to future efforts in water management development in Pakistan.

The proposal as developed by the WID Fellows was brought together by contacts with Dr. W. W. Shaner, Colorado State University and Dr. W. R. Gwinn and Dr. Baz Mohammed, GOP Islamabad, Pakistan arranged through Dr. Helen Henderson, WID/CID Coordinator. Contacts made by WID Fellows with Mr. Jon Gant and Ms. Asma Sufi were facilitated through the CID officers, Mr. Bernie Henrie, Mr. Ken Laurence and Dr. Henderson. CID funds covered expenses of housing, transportation and food. An interpreter was furnished for the American WID Fellow to translate and provide insights to the cultural norms. AID provided the services of a driver. Because a female companion was considered essential for the Pakistani female WID Fellow to be taken seriously when interviewing Pakistani males, the CID office was supportive in adjusting available funds to cover this need.

When the WID Fellows arrived in Pakistan, additional AID assistance was facilitated by contact with Mr. S. A. Chughtai, Mr. J. Tirmizi, and Mr. D. Melville. Following initial arrangements with CSU, WID, and AID personnel, actual identification of villages and families in the Punjab

Province were arranged through Mr. S. Cheema, Mr. M. A. Gill, Mr. S. Mangat and Mr. Munawar Hussain. These individuals were most directly concerned with the OFWM project in Lahore and Sheikhpura District (see Appendix A for persons contacted).

## METHODOLOGY

### Design

A questionnaire and observation guide (Appendix B) were utilized to collect data on demographic variables, on-farm activities, and formal and informal roles of the respondents in the Water User's Association. The questionnaire included also a list of agricultural and household activities, items relevant to decision making and irrigation issues used previously by another research in India (Stanbury, 1984). The questionnaire for the laborers was taken in its entirety from the irrigation study in India. The interview questionnaire and observation guide prepared in the U.S. were reviewed after discussing with host-country personnel and making a realistic evaluation of the environmental circumstances under which the data would be collected.

Our initial contacts with personnel at the AID mission in Islamabad, the Director General, On-Farm Water Management Program (OFWP), Lahore, Punjab and the Deputy Director, Water Management Training Institute provided valuable assistance in identifying villages where data could be collected. The data were collected from four villages in the Sheikhpura district. The villages were all within a 20 km radius of Sheikhpura and had participated in the watercourse improvement program under the jurisdiction of the OFWP Field Office in Sheikhpura. Watercourse improvements had taken place in two of the villages within the last 6

months and within the last 2 months in the other two villages. The villages selected by the water management personnel were those which had Water User's Associations (WUA). Respondents from the villages included officers of the association and additional participants as available.

Although our study would not have been feasible without the cooperation and assistance of OFWP personnel who directed us to the villages during the six weeks of data collection, and introduced us to the chaudhry (village leader and/or most influential land owner) to elicit cooperation, a word of caution is necessary. Our data could be considered biased to the extent that the water management field team had a vested interest in presenting a favorable picture by accessing those villages where the program had been most successful.

The villages and number of households interviewed are given below:

Table 1  
Village location and number of households

Village	Irrigation Canal	Number of Landed Respondents
I. Easerkay	Upper Googira	16
II. Bhattal	Barianwala	22
III. Harda	Upper Chenab	10
IV. Nathoowalla	Karakan Minor	8

Laborers selected for interviews were from Villages III and IV and from a location close to Village II, referred to as IIa. The table below indicates the location of the farms in relation to the watercourse in the four villages.

Table 2  
Location of farms in relation to the watercourse

Village	IH	IM	IT	UH	UM	UT	Total Households
I	1	1	2	1	1	2	8
II	3	1	2	1	-	4	11
III	1	2	2	-	-	-	5
IV	-	-	4	-	-	-	4

I = Improved  
U = Unimproved  
H = Head reach  
M = Middle reach  
T = Tail reach

#### Village Development

Primary level educational facilities are mostly available within the four villages served by the sampled watercourses. Three villages had facilities used exclusively for primary education whereas one village had a mosque with a teacher who taught grades one through five. One village had a middle and high level school for girls and boys, whereas for the other villages middle and high schools were far off, a distance of 5 to 12 kms.

Health facilities were not available to a significant extent in the villages studied. Only one rural civil dispensary was found for Nathoowalla whereas the other three villages were lacking in this respect. Control measures for malaria, spraying and quinine tablets were taken in two villages. Electricity was available in all four villages. Piped running water was available in one village, and none of the villages had brick paved streets. Three villages other than Nathoowalla had narrow open drains for sewage running alongside the house, but Nathoowalla occasionally

had large sections of the gullies or streets blocked with raw sewage, potential sites for diseases such as malaria and cholera.

### Procedures

Interviews were completed with 56 respondents (28 women and 28 men) from land owners' and owner cum tenants' families. Though the men had suggested that women's responses would be identical to theirs, the researchers were careful in interviewing males and females of the same household, separately. Interviews were conducted with 35 laborers, 33 of whom were females. Further extended interviews and observations were conducted with 17 families regarding the sequencing of typical household activities.

The first day in each village was spent meeting the chaudhry's family and the officers of the WUA. The water management personnel would introduce us and explain the purpose of the study. This earned the villagers' approval, accessed other families and avoided the problem of absent interviewees. Although we insisted on seeing small owners and owner cum tenants, either there were no tenants in the four villages, or they were not included in our sample. We were particularly interested in determining the female laborers' participation in agricultural production but, since June through July are the height of the transplanting season, we had to go to the fields to interview these women.

A proper introduction of the purpose of the study to the WUA was absolutely essential to facilitate the study and in order to avoid the impression that we represented the home or a foreign government or the tax authorities. The American team member especially attracted attention, so a host of children and women followed us from house to house. As a result,

women heard each others responses to the interview and prodded one another to give similar responses.

The members of the WUA, all males, occasionally were confused in pinpointing the officials and tended to give "courtesy responses" in regard to the WUA and some irrigation questions. Since the village chaudhry sometimes brought in males to be interviewed, undoubtedly some of the less influential respondents were intimidated, were not forthright with items pertaining to water rights conflicts and warabandi, while wishing to appear in accord with the chaudhry.

The interviews with the landed respondents lasted 30 to 35 minutes, whereas the interviews with the laborers were 20 minutes in length. However, the laborers perceived us to be the answer to their prayers in providing immediate relief to the harsh problems of life, therefore, they stayed around in groups much longer to discuss issues of importance. The observation guide/questionnaire used to collect detailed information from 17 households was administered in 1½ to 2 hours.

## FINDINGS

### Description of Sample

The size of owner and tenant cum owner families interviewed ranged from 2 to 18 members dependent upon the farm with a mean of 9.9 members. Dependents under 15 years ranged from 0-12 in number per family with an average of 3.5 per family. The mean for dependents over 15 years in age was 6.5, 3.2 of whom were females and 3.3 were males. All were extended family households. Although age is not a clearly defined concept among the villagers, responses indicated that 50% of the females were above 45 years, the range being 20-60 years with a mean of 42.8 years. Seven percent or

two females considered themselves to be the head of the household. One of these women was the wife of the chaudhry in Village I and the other an older, unmarried sister of the chaudhry in Village II. When asked about their relationship to the head of the household, approximately 68 percent or 19 identified themselves as wives, the rest as mothers, sisters-in-law or daughters. All the women in the landed households were Muslims.

Although Islamic laws of property and inheritance grant women rights to retain land and other property in their own name before and after marriage, all the women we interviewed indicated that the land was registered in the men's name. One female, a large landowner who was observed but did not grant a complete interview, though a widowed mother of three adult sons, had all the land registered in her name. She was the sole administrator of her farm and its attendant responsibilities.

In regard to education, we inquired about the highest level of education reached by a family member, both female and male (see Table 3). Nine or 36 percent of the households consisted of females with no education whatsoever. In 12 or 43 percent of the households the highest level of education attained by a female was attendance at a primary school. These females indicated that they could read the Quran which is similar to Urdu in scriptural form. Approximately 18 percent or 5 families had females who had attended middle school and 2 or 7 percent had completed matric or high school. In discussing the barriers to female education women pointed to several factors, including the physical distance to girls schools, lack of facilities such as a building for girls' school and the absence of female teachers. Others said that girls more likely than boys were held back for chores in the home such as care of infants. Two women mentioned the need

for electricity in their homes so that studying would not affect the girls vision due to eye strain.

Table 3  
Highest level of education attained by females and males

Villages	I		II		III		IV		Total
	F	M	F	M	F	M	F	M	
Level (Years)									
None	-	3	4	5	1	1	1	1	16
Primary (5)	-	4	4	-	3	2	1	1	15
Middle (8)	1	1	2	4	1	1	1	-	11
Matric (10)	-	1	1	1	-	-	1	2	6
FA/F.Sc (12)	-	3	-	1	-	-	-	1	5
BA/BSc (14)	-	3	-	-	-	1	-	-	4
MA/MSc (16)	-	-	-	-	-	1	-	-	1

#### Water Users Association

Formation and Role. In an effort to effectively implement improved water management, that is, reduce water conveyance and application losses, increase production from land levelling and improve agronomic practices the GOP and donor programs have relied on technology in the area of irrigation. The focus of the projects such as the OFWM is on the optimal provision of water and assistance to the farmer in getting the most of the allocated supply through water course improvements, and watercourse maintenance.

The formation of a Water Users Association consisting of farmers utilizing a single watercourse was deemed necessary by the OFWM Program to operate, maintain and rehabilitate the water distribution system. It was felt that such an institutional structure was necessary to represent the

irrigators and furnish a mechanism by which governmental assistance in the form of loans and construction materials could be secured to improve watercourses (Water Users, 1984).

The purpose of our investigation was to collect data on the formation and effectiveness of Water Users Association. Another objective was to gather insights into the formal and informal roles of women in water management in order to understand the variables that control women's participation, as well as to assess the impact of watercourse improvements on women.

Of the 56 respondents that were interviewed, all 28 females in the four villages indicated no knowledge of the role of Water Users Association in watercourse improvements whereas 11 or 39 percent of the males said they belonged to the WUA. Since the women were uninvolved in the formation of the WUA the males alone were asked as to the length of time the WUA had been in operation. The responses varied from within and without, that is, the respondents within the same village had different ideas about the time period when the WUA was formed which in turn occasionally differed from the response of the field officer or other governmental representative from the Sheikhpura Field Office. The discrepancy in response perhaps could be the result of a variety of reasons.

Time, except in the context of planting seasons, has little or no meaning to a rural Pakistani, therefore, the error in judgment is genuine; or perhaps some of the members of the WUA think of its inception in terms of the initial contact with the governmental representative while others could take the actual improvement of the water courses to be the beginning of the WUA. Another reason, perhaps a significant one, or so it seemed to the researchers, was the fact that the WUA was rather loosely structured,

vague in its goals, and important only to the extent of renovating the watercourses. Hence, the presence or absence of a WUA was insignificant to most of the respondents.

When asked how the WUA was formed, the perception of all respondents was that the "government", in fact, the Field Officer had taken the initiative to outline the advantages of improved watercourses and the formation of a WUA was a necessary mechanism to achieve that end. The members of the WUA were not quite clear as to who the WUA officers were in each village and neither was the role of each officer specified, once the construction of the watercourses had been completed. No elections were held to select the officers within the WUA. The members were unsure as to the meeting times and even the officers concurred that there were only informal meetings in times of need. In the course of informal conversations, the respondents related the fact that the officers were selected on the basis of perceived competence, commitment to watercourse improvement, level of education and size of landholding. In Villages I and II it was apparent that the WUA formation had been initiated by the two chaudhris of the respective villages. These two families were the largest landowners who exercised considerable influence and power within their villages. Most of the land was owned either by the extended family and/or the biraderi (a larger kinship unit). In Village III the WUA consisted of members with contiguous landholdings irrigated by the same watercourse, whereas the members of the WUA in Village IV not only shared the same watercourse but also happened to be located on the tail.

In discussing the role of the WUA the male respondents indicated renovation and improvement of the watercourses to be the primary and only function. Only 3 respondents felt that it served a function other than

watercourse improvement, such as weed elimination and the on-going efficient use of water. All the respondents felt that the WUA was active during the period of physical improvement and had ceased to function as a viable entity afterwards.

Although none of the 28 females interviewed belonged to the WUA, it was interesting to note that all 56 respondents believed that participation in the WUA was based on membership rather than gender. Women were not perceived as formal or informal participants by the males or females. However, our contacts with a female land owner provided evidence that women could just as easily have watercourse renovation if she owned land. She had the benefits of improvement without participating in WUA.

Most females sought to explain the lack of participation in the WUA on the basis of societal designation of gender roles, by indicating that irrigation and water management in landowning families was the function of a male. Furthermore, women would not interact with men who were strangers such as men outside the family or the governmental representatives who had initiated the formation of the WUA.

Benefits. Overall, the male respondents were satisfied with the formation of the WUA, to the extent that the improvement of watercourses had been undertaken and completed. The general feeling prevailed that watercourse improvement and hence the WUA had curtailed water losses, mogha tamperings and illegal diversion of water due to the implementation of the legalized "warabandi" or water rotation system.

The majority of the female and male respondents felt that improvements of the watercourses had enhanced general well-being of the family by making more cash available through increased productivity. Nine or 16 percent responded that they did not know since the benefits of increased

productivity had yet to be realized. The women in landowning families were overwhelmingly convinced that the benefits of watercourse improvements accrue to men, since it saved time, and physically was safer for the men to divert water to irrigate the fields.

Conflicts. The interviewees were careful to point out that disputes over water had diminished significantly since warabandi had gone into effect, subsequent to watercourse renovation. However, the respondents indicated that the majority of conflicts in regard to water usage arise as a result of water thefts and diversion.

Reportedly, conflicts are usually resolved by the intervention of family and relatives or by the chaudhris who casually act to intercept arguments. Admission of wrongdoing, a public apology, a promise not to repeat the act, and an attitude of humility usually suffice as punishment among first offenders and peers. However, conflicts over water usage carried to the extreme and among families wielding different degrees of power can result in physical abuse, abduction of women and murders. Unless serious, most respondents were loathe to register formal complaints or involve the police. The reasons cited were the time involved, dissatisfaction with the courts' decisions, and the ease with which the police could be bribed to render a verdict in favor of those who could afford to pay more.

Fourteen women, or 63 percent of those who responded felt they participated in conflict resolution by encouraging men to settle conflicts in a peaceful manner, the consensus being that a dead man with or without water was of minimal value. Only one female indicated that she would attempt to resolve a conflict by approaching a woman of the opposing family in order to effect a compromise. Approximately 65 percent of those who

responded thought that conflicts in regard to water usage in the past had been resolved fairly, but those who were dissatisfied with the outcome (33 percent) seemed to think that decisions had been influenced by arm twisting, misuse of power, and bribing police officials.

Related Issues. Water supply for household use such as washing dishes, small loads of laundry, personal hygiene, and drinking was supplied by handpumps installed in the yard of all homes with the exception of two families that shared a common handpump in front of the dwellings.

Three females noted difficulties with repairing of the handpumps and one pointed to an occasional odor in the water. The two females of the families that shared the handpump expressed concern in having to fetch water outside the compound occasionally in the presence of unrelated men. Larger loads of laundry were carried to the watercourses and sometimes to stagnant pools of water. The women in Village IV were cognizant of the poor drainage and stench in the village lanes resulting from stagnant water. The combination of trash, feces and standing water provided a breeding ground for mosquitoes and parasitic diseases such as malaria.

Thirty-eight percent of the respondents said that the livestock were supplied water by grazing them near the canal, although all recognized that such a practice was illegal. The threat of citations by the local police did not prove to be a deterrent. In Village II the practice of taking the livestock to the watercourses had continued, but women in the other three villages noted that they supplied the drinking to the livestock from handpumps so as to limit the damage to the renovated watercourses. Although our governmental contacts indicated that buffalo wallows had been provided with the improved watercourses, we noted an absence of these in the four villages surveyed.

## Economic Resources

All the farm women interviewed indicated that they played a vital role in the care of livestock, small ruminants and poultry. Although livestock and poultry were seldom raised as an investment or sold for cash, ownership is important as cows and specifically buffaloes prove a significant source of milk, lassi or buttermilk, yogurt, ghee and dung for fuel.

Table 4  
Ownership of animals and poultry

Villages	Cows	Buffalo	Sheep	Goats	Oxen	Donkeys	Horses	Pets	Poultry
I	31	37	65	4	7	7	11	-	40
II	21	85	41	16	4	2	2	7	82
III	4	17	6	7	3	5	1	7	28
IV	4	19	6	4	2	-	-	1	43
Total	60	158	118	31	16	14	14	15	193
Mean Per Household	2.14	5.64	4.21	1.1	.57	.5	.5	.53	6.89

The ownership of a greater number of buffaloes (see Table 4) could be attributed to the presence of the higher fat content in milk which is preferred for making butter and ghee. Oxen are used for plowing and threshing. Chickens, in addition to providing eggs, are usually cooked to serve guests. Small ruminants like sheep and goats are raised primarily for meat and sacrificing on the religious day of Eid. Women were mostly responsible for milking, processing the milk for buttermilk and ghee, while female help in the landowning households made dung cakes. Only one of the households surveyed used dung to process into "gobar gas." Dairy products were important not only for household consumption, but also as a source of cash. When we noted a divergence in male and female responses regarding

the number of livestock and poultry, our observations indicated that the female response was more accurate. Men and children grazed the cows and small ruminants while buffaloes were stall fed within the confines of the homes.

The income from selling milk and milk products was more often received by females than males. Even according to the males, 29 percent of the women sold milk, and 25 percent sold ghee regularly. The income received by males and females from the sale of milk and milk products was usually turned over to the oldest female in the household to be dispensed. Some women also intimated that they sold wheat, rice, peppers and vegetables to raise cash for household expenditures and personal use without the men's knowledge.

While the income generating opportunities other than livestock products for rural women in landed households were non-existent, and the income derived from the sale of milk products and vegetables was minimal, we were interested in gaining insights into preferences for spending cash and priorities for spending if more cash became available. Since these two questionnaire items were open-ended, a diverse range of responses were elicited.

When asked what they preferred to spend cash on, 12 or 42.8 percent of the rural women (see Table 5) indicated that they would like to spend more on weddings and wedding gifts for daughters or other female relatives. A high percentage of males responded similarly.

Marriage is considered a social and moral obligation, but weddings more importantly provide a window for the display of status and an opportunity to entertain socially. Family members also feel obligated to provide an acceptable trousseau or dowry in the form of household necessities to female relatives, often associated with the acquisition of a

suitable match in almost all arranged marriages.

A great number of women seemed to place value on clothes and other basic necessities which were not specified but interestingly gold jewelry was deemed more desirable than clothes. Gold jewelry, in addition to ornamental value, is often seen as an investment and security for females who may resort to selling gold in times of need. In Pakistan, gold jewelry has almost as much liquidity as cash. However, the disposal of a female's jewelry by a male relative is seen as a desperate measure and frowned upon.

Farm women were equally interested in education and land improvement. None of the males indicated that they would spend money on education while four women (14 percent) saw education for their daughters as a means of independence and increased opportunity in a changing world where men could not be relied upon to support women for the entirety of their lives.

When asked what their priorities would be if they had more cash, once again weddings were top priority as was land improvement and increased agricultural inputs. As is evident from Table 5, even more women responded in favor of education. Home improvements were rated high by the female respondents. Twenty-five percent of those interviewed expressed a desire to make home improvements either in the structure of the house, that is a pucca (brick and cement) versus a katcha (mud) house or receiving an electricity connection. A pucca house with electricity commands more prestige. These two prestige symbols could compete for funds that could be directed into agricultural production such as watercourse improvements, land levelling and tubewells, as well as burdening the electricity supply. As it was, there were informal complaints by the respondents about loadshedding or the lack of electricity during certain hours of the day, rendering the tubewells inactive.

Table 5  
Priorities for spending cash and additional cash

Village	I		II		III		IV		Total	Female
	F	M	F	M	F	M	F	M		
Priorities for spending cash										
Marriages/Gifts	2	3	6	6	2	2	2	-	12	
Gold/Jewelry	-	-	5	-	3	-	1	-	9	
Clothes	1	1	5	2	-	-	2	1	8	
Land	2	2	-	-	2	1	-	1	4	
Education	1	1	3	1	-	-	-	-	4	
House	1	1	1	2	-	-	1	-	3	
Fertilizer/Pesticide										
Gas	2	2	-	6	-	-	1	-	3	
Saving	2	-	-	-	1	-	-	-	3	
Necessities	1	1	1	1	4	-	-	1	2	
Luxuries	-	-	-	-	-	-	-	1	1	
Land Improvement	1	1	-	-	-	-	-	-	1	
Business	1	-	-	-	-	-	-	-	1	
Tubewell	1	1	-	-	-	-	-	-	1	
Livestock	-	-	-	1	-	-	-	1	-	
Priorities for additional cash										
Land/Ag. Inputs	3	3	3	6	3	3	-	2	23	
Marriage	2	3	4	2	3	1	3	1	19	
House/Electricity	1	2	4	1	-	-	2	-	10	
Education	1	-	4	1	-	-	-	-	5	
Business	-	-	-	1	-	2	1	-	4	
Gold Jewelry	-	-	2	-	-	-	1	-	3	
Bank/Savings	1	1	-	-	-	-	1	-	3	
Charity	1	1	-	-	-	-	-	-	2	
Roads	1	1	-	-	-	-	-	-	2	
Clothes	-	-	2	-	-	-	-	-	2	
Tubewell	-	-	2	-	-	-	-	-	2	
Necessities	-	-	-	-	1	1	-	-	2	
Savings	-	-	-	-	1	-	-	-	1	
Livestock	-	-	-	1	-	-	-	-	-	

While 71.4 percent of the females and males indicated that the older woman of the household dispensed the income and cash, only two or 7.1 percent of the females said that they met their own personal requirements. The rest felt that the males provided for their personal needs such as clothes, cosmetics, shoes, etc.

## Agricultural Resources

Farm Composition. Out of 28 farms, 14 (50 percent) were operated by single operators and 50 percent of farms were being administered jointly. Nineteen or 67.8 percent of the sample farms were consolidated, that is, comprised of one parcel only. About 57 percent of the farms were fragmented in two to three parcels while nine or 32 percent were in one parcel, and the remaining two farms were fragmented into 4 and 7 parcels, respectively. Fifty percent of the farmers had one parcel on the improved watercourse. Nine (32 percent) had two parcels and the remaining five (18 percent) had 3 parcels on the renovated watercourse.

As regards the classification of the farms by tenureship, the rest were operated by owner-cum-tenants. None of the farms included in our sample was managed by tenants only.

Nineteen or 67.8 percent of the sampled farms were comprised of 5 to 25 acres. Twenty-five percent of the farms ranged in size from 25 to 50 acres. Only one farm consisted of 150 acres. The gross area of the total farms relegated to agricultural production consisted of 690 acres. Reportedly, 19 or 67.8 percent of the farmers had no fallow land in the previous year. The remaining 32 percent had one to 12 acres that were fallow. A total of 34 acres (5 percent) of the 690 gross acreage had remained fallow during Kharif (cropping season from June to October) 1984 and Rabi (cropping season from November to February) 1984-85. These estimates indicated that 95 percent of the gross area was cropped during Kharif 1984 and Rabi 1984-85. The data collected revealed further that the most significant reason for leaving the land fallow was shortage of irrigation water as reported by 25 percent of the farmers. Seven percent indicated that the higher level of the land than water accounted for fallow

land, and another seven percent cited shortage of money and lack of equipment as important reasons for leaving the land fallow.

Water Management Issues. When farmers were asked questions concerning uses for additional irrigation water, 13 or 46 percent females and the same number of males indicated that they would increase crop acreage, whereas 86 percent women reported that they would grow high delta crops such as rice which brings a higher price per maund than wheat and 89 percent males responded similarly. Fifty-four percent females also said that they would like to increase cropping intensity if water availability were increased and another 11 percent indicated an interest in growing vegetables and sesame seeds as cash crops. Male and female responses were not significantly different; more than one response to the items was possible.

We inquired about the most critical agricultural problems farmers faced to enhance our perception of some of the constraints in agricultural production. As evident in Table 6, the responses received were diverse. More females than males saw the tedious and arduous job of transplanting paddy (munji) as the most significant problem. The higher female response is understandable given the degree of involvement by the women in that activity. Although female laborers mostly transplant paddy, men were cognizant that it is backbreaking too.

An equal number of men and women noted a lack of water and unimproved water courses as a problem. Thirty-three percent of those who reported a shortage of water had the land parcels located on the tail reach of an unimproved water course. The location of farms on any section of the improved watercourse whether head, middle or tail were insignificant when disclosing water shortage as a problem.

Table 6  
Significant agriculture problems

	Female	Male	Total
Munji	16	10	26
Lack of water	9	9	18
Lack of implements	4	4	8
Improper land level	3	5	8
Bribery and corruption	4	4	8
Lack of fertilizer	4	3	7
Lack of funds	2	4	6
Weeds	3	2	5
Access to markets	0	4	4
Agriculture Process	2	2	4
Improve (construction) watercourse	2	2	4
Tubewell problems	0	2	2
Labor costs	1	0	1
Maintenance of watercourse	1	0	1
Heat	1	0	1
Water time schedule (warabandi)	1	0	1
Pea picking	1	0	1

All farmer males and females on the improved watercourses regardless of location did not view timing as a constraint, and felt that water was more equitably distributed within warabandi. Lack of fertilizer and bribery in accessing certain roads as well as resolution of disputes were also pinpointed as areas of concern. Rural women and men who were interviewed said that they lacked respect for and were unmindful of government intervention since those who gave citations could be bought.

Farm women were asked also if they would recommend any changes in the irrigation system. The responses received were varied, but corresponded to the problems to a significant extent. Increasing the quantity of water, watercourse improvements and particularly watercourse maintenance were seen as highly desired improvements. The women seemed to be more concerned about watercourse maintenance perhaps for reasons other than irrigation. Several women in informal conversations disclosed that they found it easier

to walk along the cleared, compacted banks of the watercourse when carrying meals to the fields or collecting fodder. Others noted that laundering had been made easier along the katcha but compacted bank. More women than men also noted the need for tubewells to increase agricultural productivity.

Productivity. Due to lack of adequate bookkeeping, low literacy levels and exact knowledge of agricultural inputs assessment of income generated at best is vague. Furthermore, mistrust of strangers who may report farm income to the government or tax authorities are other deterrents to income disclosure. Awareness of these elements guided us to ask for information on total agricultural productivity and prices for the major cash crops. During Kharif the major crop is rice. The landed farmers reported yields between 10-40 maunds per acre. Discounting the two farmers whose crop had suffered insect and rodent damage, 11 or 42 percent farmers had yields in excess of 20 maunds per acre, 8 or 31 percent less than 20 maunds per acre and 27 percent exactly 20 maunds per acre. The two farmers who reported extreme damage to the crops reported yields of less than 2 maunds per acre. The average yield as reported by 26 households was 348.5 maunds of rice per household (approximately 2 lbs. = 1 seer, and 40 seers = 1 maund). The reported wholesale price for rice was between Rs. 90.00-Rs. 95.00 per maund (Rs. 15.80 = \$1.00). Not all the rice was sold, some was kept for household consumption, payment to laborers and for seed.

Reportedly, the crop yields for wheat during Rabi were more varied than for rice. Four farmers indicated crop damage and reported low yields of 1-4 maunds per acre. In calculating average yield for wheat the responses of these farmers were disregarded. Nine or 38 percent said they produced 10 to 20 maunds of wheat per acre, eight or 33 percent reported more than 20 maunds per acre, whereas seven or 29 percent indicated a yield

of exactly 20 maunds. The average yield of wheat noted by 24 farmers was 202.7 maunds per acre. Wholesale price of wheat in the Sheikhpura district was Rs. 70 per maund. As indicated in the case of rice, some wheat was kept for household consumption, seed and for payment in kind. Since roti (whole wheat, flat, unleavened bread) is a staple, it would be accurate to assume that more wheat than rice is kept for consumption.

Some farmers reportedly produced sugarcane, gurh (minimally processed lumps of brown sugar), sesame seeds and vegetables. Those who produced cotton retained the fiber for household consumption, exclusively. The selling price for sugarcane and gurh was Rs. 120 per maund and Rs. 80 per maund, respectively. Due to the seasonal nature of the vegetables grown, difficulty was encountered in assessing the price.

Agricultural Decisions. As indicated in Table 7, both females and males agreed that the male was most often responsible for the 11 agricultural decisions included on the questionnaire. Both females and males indicated that females participated in at least five agricultural decisions. According to the females, they participated most frequently in decisions relevant to time of planting (32 percent), transplanting (29 percent), and type of seed to use (29 percent). Six or 24 percent also made decisions about the acreage of crops and fodder to be cultivated. Within the bounds of cultural traditions, agricultural decisions as viewed by the respondents are the males prerogative. Therefore, it was felt that males and females reported males to be the agricultural decisionmakers even when the females might have influenced the decisions. It is interesting to note, however, that the females more often saw themselves participating in these decisions that did the males.

Table 7  
Agricultural decisions

	Male Responses					Female Responses				
	Female	Male	M. H.	M-F	NR/NA	Female	Male	M. H.	M-F	NR/NA
1. Time of Planting		22		5	1		19		9	
2. Time of Transplanting		22		5	1		20		8	
3. Acreage of Crops		22		5	1		22		6	
4. Type of Seed to Use		22		5	1		20		8	
5. Acreage of Fodder Crops to be Cultivated	2	22		4		2	22		4	
6. Type of Fertilizer		27		1			27		1	
7. When to Irrigate		27		1			27		1	
8. When to Clear Watercourses		26	1	1			26	1	1	
9. Amount of Pesticide to Use		17	1	1	9		16	2	1	9
10. Timing of Weeding		22		1	5		22		1	5
11. When to Market Harvest		27		1			27		1	

NR = No response  
 NA = Not applicable  
 M.H. = Paid male laborer  
 M-F = Either or both male-female

## Household Production

Activities associated with the maintenance of life through provision of food, clothing and shelter are an integral part of a society's existence. Resource commitments made in this sphere have a direct relationship to resource allocation in other areas of human activity. The investigation of the provision and allocation of water to domestic purposes also is needed to provide a total picture of the effects of irrigation and of agricultural productivity.

Division of Responsibilities. In this study, 14 household activities were identified on the research questionnaire. Compared to Stanbury's questionnaire (1984), garden care was omitted, washing clothes was added and grain care was separated into care of grain in the home and grinding grain. Both male and female heads were asked who generally did the specified task. The responses are summarized in Table 8.

For the most part, both females and males agreed that the five tasks listed below were exclusively the tasks of female members. These tasks are:

- cooking, including making ghee
- fetching water
- caring for children
- washing clothes
- caring for grain in the home

Although grain was most often ground by machine in the village, if it was done at home, it was a female task. Another task, making cow dung cakes, was also an exclusively female task performed by the female member or by paid female help. The remainder of the tasks were performed by various persons including either the male or female family member, paid male or female laborers or children.

Differences in the responses between males and females in relation to who generally did the tasks were observed. To more clearly show the differences, a summary was made by totaling the reported participation on all tasks and determining the percent of the total possible responses and is shown in Table 9. Subtotals are given for female and male family members as well as for all females and all males whether paid or not and for children.

As seen in the table, males reported less female participation than did females for both female family members and female laborers. Conversely, males reported higher participation for themselves and paid male laborers as compared to female reports of activities performed. Males also underestimated children's participation in household tasks as compared to female responses.

Because of women's involvement with home related activities, it is assumed that her perceptions of who did the activities was more accurate. In some cases, males appeared to confuse supervisory activity with the actual carrying out of the task.

The individual task (see Table 8) which accounted for the greatest differences in female/male responses was milking livestock. Ten more females than males saw milking as their task while three more males than females reported that milking was performed by either males or female members.

Female and male respondents agreed that female family members were least likely to prepare fodder in the home but differed in their report of who generally did it. Females reported children's participation in the task more often than males. Family males or male help were more likely to perform this task.

Table 8  
Summary of household activities

	Female Response N=28							Male Response N=28								
	Female	Male	F. H.	M. H.	Child	M-F	NR/NA	Machine	Female	Male	F. H.	M. H.	Child	M-F	NR/NA	Machine
Cooking	23								27	1						
Fetching water	26			1	1				27	1						
Make dung cakes	12		15				1		14		5				8	
Gathering fodder	8	10		5	2	2	1		8	9	1	5	3	1	1	
Prepare fodder in home	0	13		5	5	2	2	1	0	12		8		5	2	1
Milk livestock	13	10		1		3	1		3	17		1		6	1	
Make ghee		27					1		27						1	
Graze livestock	2	8	1	7	9		1		2	11		7	7		1	
Collect firewood	2	9	1	7	9		1		3	13		6		6		
Care for children	21	1	1		1		1		21	1	1		1		4	
Grind grain	7	1		1				19	7	1		1				19
Wash clothes	27			1					27		1					
Care for grain in home	27					1			26	2						
Purchase food from market	4	12		1		11			3	15		1		9		
<b>Total Responses</b>	<b>200</b>	<b>64</b>	<b>19</b>	<b>28</b>	<b>18</b>	<b>27</b>	<b>12</b>	<b>20</b>	<b>191</b>	<b>93</b>	<b>9</b>	<b>29</b>	<b>11</b>	<b>27</b>	<b>18</b>	<b>20</b>

NR/NA = No response or not applicable  
M-F = Either or both male-female  
F.H. = Female help  
M.H. = Male help

Table 9  
Female/Male Response Differences on Household Activities

Total Responses	Female		Male		% Difference in F/M Responses
	N	%	N	%	
Female	200	51	191	49	2
Female Help	19	5	9	3	2
Subtotal Female	219	56	200	51	5
Male or Female	27	7	27	7	-
Subtotal with Female/Male	246	63	227	58	5
Male	64	16	83	21	5
Male Help	28	7	29	7	-
Subtotal Male	92	23	112	29	6
Subtotal with Male/Female	119	30	139	35	5
Children	18	5	10	3	2
Total Possible Responses	392		392		

Males and females generally agreed that children did not collect firewood and it was generally done by male members or paid male laborers. Responses indicated that females were least likely to take livestock for grazing and the task appeared to be fairly equally divided between children and paid or family adult males.

In many cultures, the purchase of food is a household task performed by women. In the villages in this Islamic culture, it was more often reported as a male task. Since women are to be protected from male strangers, they are not encouraged to venture into the larger marketplaces. The food shopping done by women was usually in the market in her own village.

In summary, five tasks were identified as exclusively female tasks. When combining the either male or female category with the female category, women were found to be involved in all of the tasks except grazing of livestock. Male members were involved with gathering fodder, preparing fodder, milking, grazing livestock, collecting firewood and purchasing food. Children helped most often with grazing of livestock but were sometimes responsible for gathering fodder and according to females, preparing fodder.

Although women are considered to be responsible for household activities, the data reveal considerable involvement of all family members in the fourteen household tasks. Analysis of the tasks, however, indicate that the so-called household activities are an integral part of the agricultural system. Responsibility for care of livestock, storage and use of grain, obtaining water and provision of fuel as well as the feeding, clothing, and sheltering of the human resources of family members consume time and effort of household members.

Household Decisions. Although decision making is a complex process of interaction and is not easily studied, the questionnaire included some questions which indicated some directions among the respondents. As indicated in Table 10, both females and males reported more decisions made by males than by females. The amount of participation in decision making by females as reported by the males was less than that which was reported by females. Again, results indicated a difference in perspective of males and females. There was general agreement that females were more often responsible for food, home improvement, clothing and other household expenditure decisions than in the decisions about livestock and harvests.

Extended Interviews. Interviews with female heads regarding the daily household activities provided additional details regarding the performance of household tasks and other household resource allocation. Interviews were conducted with 17 households. The families ranged in size from one (a widow) to 17. Four of the families were laborer families and the remainder were landed families. The head female interviewed was, with a few exceptions, the wife of the head husband. The exceptions were (1) a daughter-in-law because the wife was too elderly to respond, (2) three teen-age daughters since the wife was not at home, (3) elder sister of the two male heads, (4) a daughter-in-law since head male was widowed.

It was anticipated that the researcher would be able to observe and make time use records for a considerable part of the household day. As arrangements were being made for village visits, it became evident that much of the household activity would be accomplished before the research team could reasonably arrive to begin observations. Therefore, an alternative, open-ended interview method was utilized.

Table 10  
Household decisions

	Male Response N=28							Female Response N=28								
	Female	Male	F. H.	M. H.	Child	M-F	NR/ NA	Machine	Female	Male	F. H.	M. H.	Child	M-F	NR/ NA	Machine
Foods	15	11				2			15	8						5
Home improvement	19	5	1			3			19	2	1					6
Purchase/sell livestock	5	22					1		5	22						1
Clothing	15	5				8			15	4						9
Fodder		27					1			26	1					1
Harvest sale		27					1			27						1
Bank loans		13					15			14						14
Repay loans		13					15			14						14
Household expenses	19	12				2			13	13						2
<b>Total Responses</b>	<b>68</b>	<b>135</b>	<b>83</b>			<b>15</b>			<b>67</b>	<b>130</b>	<b>89</b>					<b>22</b>

M-F = Either or both male-female  
 F.H. = Female help  
 M.H. = Male Help  
 NR/NA = No response or not applicable

Through use of the interpreter, the respondent was asked to give an account of the sequences of a typical day. Probing questions were used to elaborate on details of the activities, giving validity to the task as well as more information. Respondents were also asked to show where and how tasks were performed when possible. The entire interview was conducted while sitting in the respondent's courtyard. This also helped to validate responses since location and equipment were frequently pointed out and discussed. The process usually lasted for 1½ to 2 hours plus time for looking at the house arrangement and taking pictures.

The information gained will be discussed in relation to the following: (1) task identification, (2) task analysis, (3) schedule of daily activities, and (4) number and quality of household resources.

Task Identification. Approximately 80 discrete activities were identified from the responses of the females. These were then categorized into more major types of human behavior. The resulting list is found in Appendix C and includes the number of times each activity was mentioned or discussed by the interviewee. It should be noted that some tasks vary by seasons of the year but probing for this information was beyond the scope of this project.

Task Analysis. Following the listing of discrete tasks, thirteen tasks which were most commonly mentioned and for which the interviewer had the most information and observations, were selected for further description. The tasks were described in terms of the steps in the task process, equipment and supplies used, work area, body positions and work personnel (see Appendix D).

The task analysis process was used to give a more systematic approach to the interview data and to help identify gaps in information about the

various household activities. Slide pictures and prints were also organized to accompany the majority of the tasks observed.

It is assumed that performance of the tasks may vary to some degree from one household to another. Considerable similarity was observed, however, in the number of tasks that all women performed in a squatting position, and in the similar types of equipment used for the various tasks.

Schedule of Daily Activities. A pattern for a typical day was constructed from the interview data (see Appendix E). Clock times were suggested by the Pakistani interpreter, sometimes in consultation with the interviewee. Since no clocks or watches were apparent in the households, the times are not verified. Prayer times were, however, mentioned as a point around which activities were scheduled. A suggested description of approximate times for prayer was also constructed and is given below:

#### Prayer Times During July

4:00 a.m.	Morning	finish before first rays of light or sky is getting light
1-2:30 p.m.	Afternoon	when shadow is same length as person
5-5:45 p.m.	Evening	when shadow is two times length of person - before sun rays turn yellow
7:15-7:35 p.m.	Sundown	when sun goes down but not dark
8:15-midnight	Night	complete darkness

All women reported beginning their day's activities before daylight with personal hygiene and prayers. Since modesty of women is valued, it was expected that their bodily functions would be performed early in the day or after dark when they would not be observed by others. When asked if this were an uncomfortable behavior, the reply was "we get used to it."

Daily activities are carried out primarily in relation to prayer times, children's activities, agricultural and livestock responsibilities,

and physical energy. Making bread; processing of milk into lassi, butter, ghee, and yogurt; sweeping; laundry; preparing vegetables; and taking meals to the field were seen as daily tasks by most women. Although not mentioned as a task, child care was an obvious responsibility for most. Also, fuel needed to be obtained and fires made in order to carry out food preparation processes each day.

Number and Quality of Household Resources. Since researchers were interested in overall resource use, efforts were made to gain some impression of available resources. Observation of house arrangements and possessions was possible since interviews were conducted in courtyard or room of the house. If the interview was in the courtyard, the pattern was to ask to see the house and/or to take a picture of a family member in her house. (Note: In most homes, the men, women and children welcomed picture taking. One exception was encountered in two related families in Village I. In this case, pictures of female laborers were permitted as substitutes for the family member performing the task.)

After leaving the villages, the interviewer made sketches of the general room and courtyard arrangement for each interview. Measurements were taken of one living unit (see Appendix F).

The houses were basically of two types - katcha (mud) or pucca (brick or cement). The number of rooms ranged from one (one family) to 11 (1 family) with an average of 3.8. The family rooms were arranged around a courtyard. Livestock were kept in the same courtyard in two cases or in courtyards specifically for the purpose which adjoined the living area. For two of the families, additional rooms separate from the family living quarters were available. It was understood that these rooms were for use by men for meetings, socializing, and entertaining guests. Both contained

a dining table and chairs, and a bathroom. One contained a sofa with additional chairs and chaarpies (used for sitting and sleeping).

Furnishings for the family rooms consisted primarily of chaarpies. A few chairs were in evidence and consistently offered to the guest researchers. Other possessions included tableware displayed on shelves and mantelpieces, pottery and metal cooking and storage containers, large round or oblong metal boxes for household storage and a variety of sizes and shapes of mud storage bins.

Eight of the 17 families had electricity and this meant one or two light bulbs and/or a large electric fan. A refrigerator was noted in one of the chaudry's homes and an electric iron, as well as charcoal burning iron was noted elsewhere. One bride of six months mentioned that her dowry contained other electric appliances. Access to a television was noted by the chaudry's family in Village II. One of the adult male brothers had a television at his house in Sheikhupura which family members and male friends could visit.

Each of the courtyards with the exception of two contained a hand pump as the source of water. Two families used a pump in an adjoining courtyard shared with another family. The courtyard for all the families was the location of the cooking arrangements. Most contained a small fireplace for cooking rotis and/or a tandoori oven (a clay oven) and an additional clay arrangement for keeping milk warm during the day. Several of the women indicated another cooking arrangement inside a room for rainy days.

### Laborers

Sample. Thirty five individuals (33 females, 2 males) who worked mostly as paid laborers were interviewed for their participation in the agricultural system and to determine if the laborers perceived any effects,

positive or otherwise, on their activities as a result of the improvements in the watercourse. Questionnaire items (see Appendix A) focused on paid and unpaid activities of the female laborers, availability of work, livestock resources, status of domestic water supply and decision making. Only data pertaining to female laborers' responses will be discussed.

None of the female laborers had been educated with the exception of one, who had attended primary school. Since religion can play a critical role in the type of wage work available to women, we asked about the religious background. Twenty-three of the female laborers were Muslim and 10 were Christians. The Christians in the villages were a second generation of the untouchable castes of Hindus who had converted before pre-partitioned India. Ideally, in an Islamic society the concept of untouchables is non-existent but in practice when employed as domestic workers these individuals are assigned the task of sweeping and making dung cakes, often deemed unsuitable activities for Muslims. The Christian sample of laborers in Village IV lived in a segregated community, where the housing was provided by the landowners.

All the female and male laborers were landless. The size of the laborers' families ranged from one to 13 family members with an average of 7.2 members (see Table 11). As the table indicates, the total number of females, adults and minors, in the 33 families, was 118 as contrasted to 121 men. Forty-eight percent of the women were employed outside the home on a part-time or full-time basis, whereas 73 percent of the men were employed.

Table 11  
Number of laborer family members

Village	Females	Earning	Non- Earning	Males	Earning	Non- Earning	Total Families
IIa*	42	22	20	40	20	20	10
III	62	11	51	61	24	37	18
IV	<u>14</u>	<u>5</u>	<u>9</u>	<u>20</u>	<u>7</u>	<u>13</u>	<u>5</u>
Total	118	38	80	121	51	70	33

\*Located close to Village II.

Agricultural and Other Paid Labor. We attempted to ascertain the number of employers each laborer worked for in a given year. Six or 18 percent worked for one employer, 17 or 52 percent did not know the exact number or indicated that they worked for as many as possible. Ten or 30 percent were employed by 2 to 5 families. As Table 12 indicates, the greatest involvement of the female laborers was in transplanting paddy. Women were involved with equal frequency in cutting fodder and sowing. A high degree of involvement also was reported in harvesting rice. Thirty percent of the females were working as domestic helpers. We observed women weeding or transplanting in the fields during the less warm hours of the morning, working in the landed households from 10 a.m. to 2 p.m. and then returning to the fields. Four or 12 percent of the Christian laborers made dung cakes exclusively for 3 or 4 households.

Resources. In order to get some idea of the laborers' income we tried to determine the form, frequency and amount of payment to the female laborers. The diversity of responses elicited, the hesitancy to report income, genuine lack of the laborers' awareness about exact income and the variety of activities in which the sampled laborers participated were some

Table 12  
Laborers paid work<sup>1</sup> by villages

Activities	III	IV	IIa	Total
Transplanting	9	5	5	19
Cutting Fodder	6	5	5	16
Sowing	7	5	4	16
Harvesting (Rice)	8	4	3	15
Domestic Work	2	1	7	10
Weeding	3	2	4	9
Threshing	3	2	4	9

<sup>1</sup>More than one response was possible.

of the barriers to definitive conclusions.

The majority of 19 or 58 percent reported cash and grain as the form of payment, 8 or 24 percent were paid in cash only and 7 or 21 percent received grain only as payment for labor. It is customary to receive payment seasonally or monthly when grain is the mode of remuneration. Domestic laborers were paid monthly, mostly cash, as were those involved with transplanting paddy. Harvesting and threshing usually accrued grain for wages.

Laborers reported receiving Rs. 70 per acre for paddy transplantation with 3 to 4 being the average number of acres transplanted per season, and the receipt of 2 to 4 seers per maund of grain, wheat or rice harvested. Those employed in domestic work reported a monthly income of Rs. 50. The estimated reported income ranged from Rs. 550 to over Rs. 1200.

The female laborers whose form of remuneration was grain complained vehemently of exploitation by the landed households in terms of the

declining value of grain when they needed to trade grain for cash. They indicated also that if the landowners declined to pay or defer payment for transplanting until the harvest season, the females had little recourse. Consequently, they would organize themselves into working teams of four or five with a male as a team member responsible for negotiating wages. The male team member, as reported by the females, was the recipient of equal pay as the women, and from our cursory observations was equally hard at work at the tiresome task of paddy transplanting.

When asked if their income sufficed to meet their basic needs, only 8 or 24 percent responded positively while the rest indicated that they barely eeked a living. Sixty-one percent noted that as primarily agricultural workers there were times during the year when no work was available. Thirty percent cited participation in household work as a supplemental source of income, whereas one laborer reported leasing out her buffalo for part of the milk, and another the involvement of her children in carpet weaving. Unlike the landed households, female laborers sold few products related to livestock. Three indicated that they sold dungcakes, two reported selling milk and only one said that she sold ghee.

As expected, livestock production among the women laborers families was lower compared to landed families. Fifteen families reportedly had one to nine buffaloes, two had oxen and only one respondent had cows. One respondent said she raised poultry for eggs and had 25 chickens.

Acquiring fodder for the livestock was difficult for some of the respondents; four purchased fodder, whereas five resorted to illegal options such as stealing from the landed households, whereas another nine said that they purchased fodder from the landholders, or received it as payment for the tending or grazing of livestock.

Greater concern was expressed in providing water for the livestock. Seven of the 21 responses indicated that the livestock got water at the watercourse, an additional 3 at the canal, 4 from stagnant pools of water, and another 7 from handpumps in the compounds of the houses. Multiple responses also were possible.

The respondents realized that it was illegal to feed water to the livestock at the canal, but watercourse renovations had placed greater constraints on them. The landholders who had participated in the watercourse improvements had admonished the laborers about trampling the compacted banks of the watercourses, but no provisions had been made to water the livestock such as the construction of water pools or buffalo wallows. Laborers indicated that providing water to the livestock would add to the workload. According to the women, men who often grazed and watered the cattle outside the home did not see it as their responsibility when the source of water was inside the family courtyard.

For household use and consumption, only three respondents did not have access to a handpump in their courtyard. Two drew water from a neighbor's pump; and one from a standing pool of water.

Once again, in the use of water for household tasks, the problem we heard was related to the renovation of watercourses. Seventy-nine percent of the respondents reported that prior to the improvement in watercourses they had laundered large loads along the banks of the katcha unimproved watercourses, but had been warned about the deleterious effects of pounding the clothes with a stick on the lining of the watercourses. Consequently, large loads of laundry were either washed at home placing a tremendous strain on the already overworked laborer or still done at the watercourse at the risk of being caught and penalized.

When the laborers were asked if improvements in water management had increased or decreased opportunity for wage work, 78 percent indicated that there was no difference since it was too soon to realize the benefits or drawbacks of the renovated watercourses. Fifteen percent felt that the potential for agricultural work would diminish as few male laborers would be needed to clean the watercourses and would replace them in the fields. Twelve percent reported that agricultural activity would increase as a direct result of the availability of water. Furthermore, they thought the backbreaking task of transplanting paddy would still be a woman's lot.

Household Activities. As noted in Table 13, women are involved exclusively in several household tasks. These activities as contrasted to the women in the landed households include a high degree of involvement in food purchasing and collection of firewood.

Household Decisions. Female laborers were instrumental in making decisions in three of the five areas we had listed (see Table 14). Since they were involved primarily with food purchasing activities they reported making decisions about food purchases as well. Home improvement decisions are theirs because it is the women who dig mud from uncultivated vacant land, mix it with hay and plaster the walls. The females reported the lack of faith males had in the ability of women when a transaction was financially substantial. Reportedly, males felt that they were more worldly wise and other men would take advantage of women in conducting business.

Table 13  
Laborers' household activities

Activities Villages	Females				Female Children			M/F			Not Applicable			No Response		
	IIa	III	IV	Total	IIa	III	IV	IIa	III	IV	IIa	III	IV	IIa	III	IV
Cooking	5	18	10	33	0	0	0									
Laundry	5	10	18	33	0	0	0									
Fetching water	5	18	9	32	0	0	0									1
Care of grain	10	18	9	32	0	0	0	1								
Making dung cakes	5	10	15	30	0	0	0									3
Child care	4	6	16	26	0	1	0				1	2	2			1
Purchasing food	5	4	17	26	0	0	0	0	2	1						
Collecting firewood	4	5	12	21	0	1	1		1		0	0	0			
Making ghee	3	9	7	19	0	0	0				2	1	11			
Gathering fodder	3	2	10	15	0	1	0		1		2	1	4			
Prepare fodder	3	3	8	14	0	0	0				2	1	5			
Milking	3	5	5	13	0	0	0				2	1	11			
Grazing Livestock	1	3	5	9	0	3	0				2	1	5			

F-M = Either or both male-female

Table 14  
Laborers household decisions

Decisions	N=33	Female				Female or Male			NA	NR
		IIa	III	IV	Total	IIa	III	IV		
Home Improvements		4	9	18	31					
Clothing Purchases		5	7	15	27		1			
Food Purchases		5	5	16	26		1			
Fodder Purchases		3	2	6	11	1			7	
Purchase/Sell Livestock		0	2	2	4				10	

NA = Not applicable

NR = No response

#### Use of Cash

We were also interested in finding out how women workers would spend cash (see Table 15). Given their meager income, as expected, 76 percent or 25 noted that they would spend it on necessities such as food and clothes. Another 15 percent said they would make improvements in the home. Nine percent indicated if they had cash it would be spend on weddings. Fifteen percent were desirous of paying back loans and on medication. Three percent wanted to buy land, fertilizer or spend cash on a religious holiday.

When asked about priorities for spending with the potential of additional earnings (see Table 16) three laborers felt it was an unrealistic desire, therefore unimaginable. Priorities in order seemed to be weddings, home improvements and investment in livestock and land.

Table 15  
Laborers' priorities for spending of cash

Choices	IIa	III	IV	Total
Daily necessities	4	6	15	25
House	1	2	1	4
Marriages	0	3	0	3
Medicine	0	2	0	2
Payment of loan	0	0	2	2
Land	0	1	0	1
Holidays	0	0	1	1
Fertilizer	0	0	0	0
Luxuries	0	0	0	0

Table 16  
Priorities for additional cash

Choices	IIa	III	IV	Total
Weddings	1	4	5	10
Home Improvements	0	3	5	8
Livestock-Land	1	2	3	6
Unrealistic	3	0	0	3
Necessities	0	1	2	3
Clothes	0	2	1	3
Children	0	2	0	2
Loan	0	0	2	2
Food	0	1	0	1
Bed, Trunks	0	0	1	1

#### SUMMARY OF FINDINGS

The presentation of findings in the previous section has provided data about water management in relation to a total family/farm perspective. It has included a description of the role and function of the Water User's Association as well as agricultural and household productivity. More importantly, the data collected for the study has included both male and female perspectives on all topics. This is significant in that the majority of water management development project personnel tend to be males and, in Islamic countries such as Pakistan, this represents a considerable

constraint for acquiring female views on issues. Further, it has included households with a range of socio-economic status: 56 landed interviewees and 35 laborers. One-half of the landed respondents were men and one-half were women. Data also represent information from four different villages.

#### Characteristics of Landed Households

1. Village families follow the traditional culture of extended family composition with an average of 9.9 members including parents and married children and with a mean of 3.5 under the age of 15.

2. Over one-third of the females have no education at all and primary school attendance was the highest for the remaining majority. Several reasons were identified for lack of female education including the need for female children to remain at home to do chores.

#### Water User's Association

3. All villages had participated in watercourse improvement within the last year. Although females were cognizant of the improvements in the watercourses, none of the females indicated any knowledge of the WUA and slightly less than one-half of the males were aware of association with the organization. Male respondents in general were unclear about the role and function of the organization. The function of the WUA was considered to be that of renovation and improvement of water courses. The need for continued maintenance such as weed elimination was not perceived as an on-going undertaking of the WUA.

4. Although gender did not appear to be the basis for membership, both males and females perceived irrigation and water management to be a male responsibility. The sheltering of females from male strangers was a part of the perceived lack of female participation.

5. General satisfaction was expressed with WUA accomplishments specifically in relation to watercourse renovation. Improvements were seen as curtailment of water losses and mogha tamperings, illegal water diversion and diminished number of disputes.

6. Disputes can have extremely serious outcomes. Reluctance to register formal complaints in preference to a variety of informal methods within the village was indicated due to a lack of confidence in effectiveness of more formal methods. Females perceived that they had an informal role in conflict resolution within the family of encouraging more peaceful means of handling conflicts.

7. Increased cash was seen by both men and women as the benefit of water course improvement and women in particular saw benefits of time saving and physical safety for the men.

8. Domestic water needs were met with hand pumps in household courtyards. Although this is a considerable saving over other types of sources, females noted some problems including drainage.

9. Although aware of the illegality, over one-third of the villagers cited use of the canal for watering livestock.

#### Agricultural Activity

10. Ownership of livestock, small ruminants and poultry varied considerably among households, though all reported ownership of some buffalos and poultry. Ownership of livestock is a measure of wealth and is significant as sources for food, fuel, and religious sacrifices. More females than males saw animals as sources of cash income.

11. All females indicated having a major responsibility for care of animals and poultry as well as processing animal and poultry products.

Approximately one-fourth received income from livestock products which were generally dispensed by the head female.

12. Both men and women saw their social responsibilities for weddings as highest priority for additional cash. Women also saw basic necessities, education and land improvement as high priorities in contrast to agricultural expenditures such as land leveling, electricity, and tubewells.

13. Both single and joint farm operation were common and over half of the farms were typically divided into 2-3 parcels. Single operators were typically owners and joint operators were owners cum tenants. Farm sizes commonly ranged from 5-25 acres with about one-third having 1-12 acres of fallow land.

14. The majority of both males and females indicated an interest in increasing high delta crops such as rice which results in higher cash income than wheat, if water were available.

15. More females than males saw the tedious and arduous task of rice transplanting as a significant agricultural problem. Water shortage was noted as a significant problem by those on the tail of the unimproved watercourses. Most males and females agreed that timing of water supply was less of a problem since the watercourse had been improved.

16. Women more than men saw watercourse maintenance as a highly desired improvement possibly due to their use of the banks when carrying meal or collecting fodder and when using water courses for laundry.

17. Annual rice productivity was estimated for the majority at 348.5 maunds, some of which was kept for household consumption, seed, and payment to laborers with market value estimated at Rs. 90-95 (Rs. 31,320 or US \$1982 at 15.8). Though more variable than rice, wheat yields were

estimated at 202.7 maunds, also with similar uses (Rs. 14,189 or US \$898 at 15.8).

18. Less frequent crops were sugar cane, gurh (brown sugar), sesame seeds and vegetables. Cotton crops were primarily for household consumption.

#### Household Production

19. Males tended to overestimate their participation in household activities and underestimate female and children's participation when compared to female responses. Males also underreported involvement of females in household decision making when compared to female responses. While females were almost exclusively responsible for cooking, laundry, care of children, use and care of grain in home, and making cow dung cakes, both female and male family members or paid laborers in some families were involved in care of livestock including milking, grazing, gathering and preparing fodder.

20. Making bread; processing of milk into lassi, butter, ghee, yogurt; sweeping; laundry; preparing vegetables; and taking food to fields were seen as daily tasks by most of the women. Making mud storage bins, re-mudding and leveling of floors were indicated as occasional tasks.

21. About one-half of the villagers interviewed had electricity which was used for one or two light bulbs and/or a large electric fan.

#### Female Laborers

22. Almost half of the women in laborer families were employed part or full time when work was available. The majority of the females worked for more than one employer. Female laborers had received no education, an even more extreme lack as compared to females of landed families. Over

one-third of the laborers were Christians and lived in segregated housing provided by the landowner.

23. Transplanting paddy was the most frequent employment but employment also included cutting fodder, sowing, weeding, harvesting rice and domestic work. Income received for labor was in the form of cash and/or grain. When paid in grain, it is received at the time of harvesting. An average yearly income might be Rs. 550-1200 (\$34-\$75 US using 15.8 exchange rate). Sale of livestock produce was even more minimal as compared to landed households. The majority indicated their incomes were insufficient for daily living.

24. Ownership of livestock was minimal and acquiring fodder was difficult and sometimes illegal means were used to obtain it. Acquiring water for livestock was an even more difficult task, resorting to water courses, canal, stagnant pools or hand pumps.

25. The majority of the households had access to handpumps in their own or neighboring courtyards. When the livestock water source was inside the courtyard, it became a female task as compared to male responsibility when water was available outside the family courtyard.

26. Laborers felt that water course improvements might reduce the need for male labor for clearing courses and thus would divert males to field work, possibly replacing females.

27. Water course improvements resulted in restrictions on doing laundry since pounding clothes with a stick weakened the cement or improved earthen banks.

28. Female laborers were more involved in food purchasing and collecting firewood than females in landed households. The majority of female laborers felt cash should be spent on necessities of living, though

it seemed unrealistic to consider. If additional cash were available it would be spent on weddings, home improvements and agricultural investments.

#### Current Benefits to On-Going AID Project

1. While implementing this project, numerous contacts were made by the American and Pakistani female researchers with host country administrators as well as villagers. In each case certain aspects of female role modeling were conveyed to the persons contacted. Several contacts were also made with USAID officials. Each contact represented another means of emphasizing the necessity for considering gender differences in developmental efforts, including water management.

2. A seminar was held with host country AID program specialists in which preliminary findings of the study were presented and recommendations discussed.

3. One of most significant though perhaps most disheartening interchange was the contact with the Diagnostic Analysis Team functioning in Lahore at the same time. Initial contacts with the group brought to the surface the absence of any workshop plans for including gender differences.

4. An interview was also held with S. Hafeez, Director Research, Women's Division, Pakistan, to convey to her the project's goals and implementation.

5. Recognition was made in the final OFWM (Credit 1163-Pak) report by Dr. Wendell Gwinn of existence of the project and his help in orienting WID Fellows to the on-going project.

## RECOMMENDATIONS

1. The water users associations are active only during the physical renovation period, but cease to be a functioning entity thereafter. Schedules and standards for maintenance of watercourses need to be determined in order to attain long-lasting benefits of the watercourse improvement program.

2. Although reportedly the frequency of illegal diversion of water had diminished during the post improvement, the WUA could frame rules for the farmers to curtail illegal options to supplement water supply.

3. The design or improvement of watercourses should include explicit consultation with women in a culturally acceptable mode. Close attention needs to be focused on the activities relevant to the design elements of the water courses, e.g., the compacted banks of the watercourses have made foot travel easier for women while carrying food to the fields and collecting fodder. However, the female laborers especially expressed concern about the lack of laundry facilities and provisions for bathing children and livestock. Laundry pads, buffalo wallows, and water pools need to be provided with more frequency. The effects of pounding on the pucca watercourses during the laundering process deserve closer scrutiny.

4. Although women in the landed households noted an improvement in the general well-being of the family due to watercourse improvements, longitudinal time studies need to be conducted to assess the costs and benefits of watercourse renovations to women. The female laborers were already experiencing greater demands on household labor and time when improvements in the watercourses translated into watering the livestock in the home by the females.

5. Laborers, both male and female, are a significant component of the agricultural system in the Sheikhpura District. Yet, improvements in the irrigation system could pose a genuine threat in displacing female laborers when fewer male laborers would be required for the maintenance of the renovated watercourses and in diverting water. Strategies to assure female laborers of an on-going source of income need to be developed.

6. Rural women sampled noted the dearth of opportunities for income-generating activities for rural female laborers, other than in agricultural production. The appropriate agencies within and outside of Pakistan face a critical challenge in the training of rural women in income-generating activities to fully utilize the potential of vital human resources.

7. There is a marked imbalance between female and male educational levels in the Punjab area in Pakistan as in other developing countries. Progress toward optimal utilization of human potential necessitates narrowing the gap between males and females and increasing the overall level of education. Past studies conducted by AID have made useful recommendations (Bensen, 1982; Metcalfe, 1983).

8. Since women are involved in agricultural decisions to some extent and, more specifically, in livestock production, care, and processing products, relevant knowledge should be imparted to women to facilitate decision-making in these areas. In Pakistan, as in other Islamic countries, such information can only be disseminated within the constraints of the particular culture. For example, only female extension workers would have access to the rural females for training and motivation.

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APPENDICES

APPENDIX A

## PERSONS CONTACTED

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APPENDIX B

## QUESTIONNAIRE

## DEMOGRAPHIC VARIABLES:

Respondent's Name \_\_\_\_\_

Father's Name \_\_\_\_\_

Village \_\_\_\_\_

Tehsil \_\_\_\_\_

District \_\_\_\_\_

Watercourse Name \_\_\_\_\_

Irrigation Canal Name \_\_\_\_\_

Age of Farm Operator \_\_\_\_\_

Years of Formal Education \_\_\_\_\_

Are you head of household? Yes \_\_\_\_\_ No \_\_\_\_\_

If not, what is your relation with head of household?

Sister \_\_\_\_\_ Daughter \_\_\_\_\_ Niece \_\_\_\_\_ Wife \_\_\_\_\_ Mother \_\_\_\_\_

Brother \_\_\_\_\_ Son \_\_\_\_\_ Nephew \_\_\_\_\_ Father \_\_\_\_\_ Other \_\_\_\_\_

How many family members depend upon this farm?

Under 15 years \_\_\_\_\_

Above 15 years \_\_\_\_\_

Women \_\_\_\_\_

Men \_\_\_\_\_

How many family members live elsewhere?

In Pakistan \_\_\_\_\_

Outside Pakistan \_\_\_\_\_

Are they contributing to the family income? Yes \_\_\_\_\_ No \_\_\_\_\_

Other sources of income \_\_\_\_\_

What is the highest education level reached by any member of the family? (excluding the respondent)

	Female	Male
Primary	_____	_____
Middle	_____	_____
Matric	_____	_____
F.A./F.Sc.	_____	_____
B.A./B.Sc.	_____	_____
M.A./M.Sc.	_____	_____
Technical	_____	_____

Number of Children \_\_\_\_\_

Ages of Children \_\_\_\_\_

How many children go to school? (Last year) \_\_\_\_\_

Which of the following categories best describes you?

Owner operator \_\_\_\_\_

Owner cum Tenant \_\_\_\_\_

Tenant \_\_\_\_\_

Laborer \_\_\_\_\_

### FARM CHARACTERISTICS, FORMATION AND EFFECTIVENESS OF WATER USER'S ASSOCIATION

Operational administration

Single \_\_\_\_\_ Joint \_\_\_\_\_

Is your farm all in one parcel? Yes \_\_\_\_\_ No \_\_\_\_\_

If no, how many parcels? \_\_\_\_\_

How many parcels do you have on this water course? \_\_\_\_\_

How many acres do you own? \_\_\_\_\_

How many acres does your husband own? \_\_\_\_\_

How many acres does your husband operate? \_\_\_\_\_

Did you have fallow land on your farm Kharif 1984? Yes \_\_\_\_\_

No \_\_\_\_\_

Rabi 1984-85? Yes \_\_\_\_\_

No \_\_\_\_\_

Area of fallow land per year \_\_\_\_\_

If yes, what is the most important reason for having fallow land?

	Kharif	Rabi
Shortage of irrigation water	_____	_____
Shortage of labor	_____	_____
Shortage of money	_____	_____
Lack of equipment	_____	_____
To increase fertility	_____	_____
Other (specify)	_____	_____

If you had more irrigation water, what will you do?

Increase crop acreage \_\_\_\_\_

Grow high delta crops \_\_\_\_\_

Increase cropping intensity \_\_\_\_\_

Other uses \_\_\_\_\_

Are you a member of any of the following organizations?

Water user's association \_\_\_\_\_ Mosque committee \_\_\_\_\_

Any co-op society \_\_\_\_\_ Panchayat \_\_\_\_\_ Zakat/usher

committee \_\_\_\_\_ Arbitration of disputes \_\_\_\_\_ Other \_\_\_\_\_

When was the Water Users Association (WUA) formed in your community?

6 months to 12 months \_\_\_\_\_

13 months to 24 months \_\_\_\_\_

Over 24 months \_\_\_\_\_

How was it formed and by whom?

Government \_\_\_\_\_

Community leaders \_\_\_\_\_

Local farmers \_\_\_\_\_

Others \_\_\_\_\_

Who are the officers? Describe in relation to amount of acreage owned and location of water courses. 1. \_\_\_\_\_

2. \_\_\_\_\_ 3. \_\_\_\_\_

4. \_\_\_\_\_ 5. \_\_\_\_\_

6. \_\_\_\_\_ 7. \_\_\_\_\_

How often do the officers meet? \_\_\_\_\_ FORMALLY INFORMALLY

Once a week \_\_\_\_\_

Twice a week \_\_\_\_\_

Once a month \_\_\_\_\_

Other \_\_\_\_\_

What is the role of the WUA in your opinion?

Who participates in the WUA? By sex \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

By membership \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Do women participate formally? Yes \_\_\_\_\_ No \_\_\_\_\_

If not, how do they participate informally?

Types of conflicts that arise in regard to water usage? \_\_\_\_\_

How are they resolved? \_\_\_\_\_

How do women participate in conflict resolution?

In your opinion, was the conflict fairly resolved? Yes \_\_\_\_\_ No \_\_\_\_\_

Whose objectives were achieved in the past?

How satisfied are you with the WUA?

Not at all \_\_\_\_\_

Somewhat \_\_\_\_\_

Very \_\_\_\_\_

#### RESOURCES

Livestock:

Cows \_\_\_\_\_

Buffaloes \_\_\_\_\_

Sheep \_\_\_\_\_

Goats \_\_\_\_\_

Bulls \_\_\_\_\_

Donkeys \_\_\_\_\_

Horses \_\_\_\_\_

Camels \_\_\_\_\_

Pet Animals \_\_\_\_\_

\_\_\_\_\_

Do you regularly sell any of the following and how much:

1. Milk \_\_\_\_\_ 2. Ghee \_\_\_\_\_ 3. Dung cakes \_\_\_\_\_  
 4. Firewood \_\_\_\_\_ 5. Home crafts \_\_\_\_\_ 6. Other \_\_\_\_\_

Who gets the income? \_\_\_\_\_

When you have cash, what do you prefer to spend it on?

If you could earn more money, what would you spend it on?

Who meets your personal requirements, such as cosmetics, clothes, shoes, cigarettes/tobacco, etc? Specify \_\_\_\_\_

#### HOUSEHOLD/AGRICULTURAL ACTIVITIES AND DECISIONS

Describe who generally does the following activities for your family:

1. Cooking
2. Fetching water
3. Making dung cakes
4. Gathering fodder
5. Preparing fodder in home
6. Milking livestock
7. Making ghee
8. Grazing livestock
9. Collecting firewood
10. Caring for children
11. Grinding grain
12. Washing clothes
13. Caring for grain in home

Describe who generally makes the following decisions in the household:

1. Foods to purchase
2. Home improvements
3. Purchasing/selling livestock
4. Clothing
5. Fodder for livestock
6. Harvest to be sold
7. Bank loans
8. Repayment of loans
9. Household expenditures

Describe who generally makes the following agricultural decisions about your fields:

1. Time of planting
2. Time of transplanting
3. Acreage of \_\_\_\_ ( ) \_\_\_\_ ( ) \_\_\_\_ ( ) \_\_\_\_ ( )  
Refer to crops
4. Type of seed to use
5. Acreage of fodder crops to be cultivated
6. Type of fertilizer
7. When to irrigate
8. When to clean water courses
9. Amount of pesticide to apply
10. Timing of weeding
11. When to market harvest

Describe the most significant agricultural problem your family faces:

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Where do you get water for household use? \_\_\_\_\_

\_\_\_\_\_

Are there any problems with this water supply? \_\_\_\_\_

\_\_\_\_\_

How do you supply water to your livestock? \_\_\_\_\_

\_\_\_\_\_

How have improvements in the watercourses affected:

Family health \_\_\_\_\_

Diet \_\_\_\_\_

Amount of Cash \_\_\_\_\_

What, if any, improvements in the irrigation system should be made?

\_\_\_\_\_

## LABORER QUESTIONNAIRE

Name \_\_\_\_\_ Family Name \_\_\_\_\_

Education \_\_\_\_\_ Religion \_\_\_\_\_

Total family members:

Males      Earning/Non-earning      Females      Earning/Non-earning

\_\_\_\_\_

Do you work mainly for this one family:

Yes \_\_\_\_\_ No \_\_\_\_\_ If no, approximately how many families? \_\_\_\_\_

Which of the following activities do you regularly do:

- a. Sowing
- b. Weeding
- c. Cutting fodder
- d. Harvesting
- e. Threshing
- f. Transplanting
- g. Other daily work (describe).

Are you usually paid in cash or grain? \_\_\_\_\_

How much and how often? \_\_\_\_\_

Describe who generally does the following activities for your family:

Cooking

Fetching water

Making dung cakes

Gathering fodder

Preparing fodder in home

Milking livestock

Making ghee

Grazing livestock  
 Collecting firewood  
 Caring for children  
 Grinding grain  
 Caring for grain in home  
 Washing clothes  
 Purchasing food from market

Do you regularly sell any of the following:

Milk \_\_\_\_\_ Ghee \_\_\_\_\_ Dung cakes \_\_\_\_\_ Firewood \_\_\_\_\_ Home crafts \_\_\_\_\_

Other \_\_\_\_\_

When you have cash, what do you prefer to spend it on? \_\_\_\_\_

\_\_\_\_\_

If you could earn more money, what would you spend it on? \_\_\_\_\_

\_\_\_\_\_

Describe who generally makes the following decisions in the household:

1. Foods to purchase
2. Home improvements
3. Purchasing/selling livestock
4. Clothing
5. Fodder for livestock, if any

Does your family own any land? Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, is it irrigated?

\_\_\_\_\_ Any problems? \_\_\_\_\_

\_\_\_\_\_

Number of livestock owned:

Buffalo \_\_\_\_\_ Bull \_\_\_\_\_ Cow \_\_\_\_\_ Goat \_\_\_\_\_ Sheep \_\_\_\_\_ Donkey \_\_\_\_\_

Chicken \_\_\_\_\_ Other \_\_\_\_\_

If livestock, how is fodder provided and where grazed? \_\_\_\_\_

\_\_\_\_\_ Problems with providing fodder? \_\_\_\_\_

\_\_\_\_\_

Where do you get water for your livestock? \_\_\_\_\_

Where do you get water for household use? \_\_\_\_\_

Other sources of income besides agriculture? \_\_\_\_\_

Has improvement in watercourses increased or decreased your opportunities  
for wage work? \_\_\_\_\_ Is the wage work you do sufficient to  
feed your family? \_\_\_\_\_ Are there ever times when no wage work  
is available? \_\_\_\_\_

## APPENDIX C

REPORTED AND/OR OBSERVED FEMALE ACTIVITIES  
WITH TIMES REPORTED

## Food Purchase, Preparation and Service

1. Cook milk (8)
2. Make yogurt (5)
3. Make lassi/butter (10)
4. Make ghee (2)
5. Make tea (3)
6. Make chapatti/roti for morning meal (14)
7. Make chapatti/roti for noon meal (14)
8. Make chapatti/roti for evening meal(7)
9. Make chapatti/roti for morning and noon meal (3)
10. Prepare vegetable, dal, rice or meat for noon meal (12)
11. Prepare vegetable, dal, rice or meat for evening meal (14)
12. Culture milk (5)
13. Lay out meal (3)
14. Take or send morning meal to field (9)
15. Take or send noon meal to field (8)
16. Wash morning dishes (13)
17. Wash noon dishes (5)
18. Wash evening dishes (4)
19. Buy vegetables from traveling salesperson (1)
20. Buy vegetables from village market (5)
21. Get vegetables from field (2)
22. Grind wheat for cereal purposes (1)
23. Make dessert for evening meal (1)
24. Take wheat to grinding machine (1)

### House Maintenance

25. Sweep (15)
26. Mud walls, level floors (5)
27. Get repairs done (1)
28. Clean storage areas, utensils (1)
29. Build and/or decorate mud storage bins (1)
30. Tidy up (1)

### Clothing and Household Textile Construction and Care

31. Laundry (15)
32. Iron clothes (4)
33. Stitch clothes (3)
34. Spinning yarn (3)
35. Embroidery (4)
36. Make soap (1)

### Child Care

37. Get children up, dressed, bathed and fed, ready for school (8)
38. Keep eye on children (4)
39. Teach daughters handiwork and household tasks (1)

### Management

40. Supervise workers, family and other (1)
41. Keep track of needed household supplies (3)
42. Go to town market (1)
43. Get our chaarpie, set up fan, arrange for seating, sleeping (4)

### Personal Hygiene

- 44. Bodily functions (8)
- 45. Bathing (1)

### Religious

- 46. Ablution in preparation for prayers (2)
- 47. Prayers (15)
- 48. Read Koran (5)

### Leisure

- 49. Rest or nap (13)
- 50. Visit (4)
- 51. Creative textile work (stitch clothes, embroidery) (4)
- 52. Listen to radio (1)
- 53. Walk in village (1)
- 54. Play with children (1)

### Field work

- 55. Pick vegetables and collect in sacks (2)

### Paid work

- 56. Transplant rice (3)
- 57. Harvest rice (3)
- 58. Thin rice (2)
- 59. Cut wheat (3)
- 60. Make cow dung cakes (2)
- \*61. Make carpets (2)

- 62. Spin yarn (1)
- \*63. Laundry
- \*64. Sweeping (1)
- \*65. General household help (wash dishes) (1)
- 66. Pick vegetables and collect in sacks (2)

#### Fuel Activities

- 67. Collect wood sticks for fire (3)
- 68. Collect cow dung from courtyard and mix with straw for cow patties (7)
- 69. Bring cow dung from fields (1)

#### Livestock Activities

- 70. Feed and water chickens (3)
- 71. Milk buffaloes (5)
- 72. Feed and water goats (2)
- 73. Take donkeys, goats, sheep and/or cattle to field to graze (2)
- 74. Take cows to water hold (1)
- 75. Bathe cows (2)
- 76. Bring cows from field (1)
- 77. Cut fodder for feed (2)
- 78. Feed fodder to cows (1)
- 79. Tie up cows for night (1)
- 80. Bring fodder in from field (2)

\*observed paid workers performing task but did not interview

\*\*only children in family

APPENDIX D

## TASK ANALYSIS

Objective: To provide a systematic description of tasks from available evidence, to be those performed by a female in at least one or more of the households interviewed. The format of the task analysis will include: identification of task, processes employed, equipment utilized, supplies, body position, personnel, work area, and importance to household system.

Information for the constructed tasks represents a combination of the following forms of evidence and is subject to the limitations of such evidence:

- a. as reported by the women--subject to errors of social acceptance, desire to please interviewer, peer pressure, etc.
- b. as interpreted by the interpreter
- c. based on researcher's judgment of observations in the household setting, past experience and knowledge of household tasks, and additional questioning of Pakistani interpreter and other sources.

The descriptions are intended to serve as a base for clarification and identification of need for additional information.

**Task: Taking meals to field workers**

Process	assemble food ( <u>lassi</u> and <u>roti</u> ) in containers to be placed on head for carrying walk to field and return with empty containers carry out process for morning meal repeat process for noon meal
Equipment	container to hold liquid container to hold flat <u>roti</u> cloth wrapped around <u>roti</u> round circlet: placed on head to help stabilize load
Supplies	actual food items--quantity and weight varies from food for 2 or 3 to 40 or 50
Work area	food assembled in the cooking area and may be taken by a family member--if male laborers are involved, food would be delivered outside the courtyard to the person delegated to carry the load
Body position	this task is related to the work activity in the field. Distance walked would depend on how far the workers were from household, ease of walking would depend on level of land and amount of cleared walking space. Weather conditions would affect ease of work.
Personnel	family women, female laborers, family men, male laborers, children
Relation to household system	field workers cannot take time away from productive work to go back home for meal.

Task performance depends on cropping seasons. Task represents an activity crucial to the maintenance of productive labor.

Question: Is any food available which could be carried to field by laborers? What is significance of having women bring food out to field workers?

## Task: Laundry

Process	gather pans for holding water pump water into containers wet clothes apply soap beat clothes (lightly) rub dirty areas rinse bluing may be added in final rinse hang to dry if large items, may take to water course
Equipment	stick containers for water
Supplies	clothes (2-4 items) soap water bluing, if used
Work area	hand pump or tap in own courtyard or outside in a common courtyard and/or at the water course. Items are hung to dry in courtyard.
Body position	usually done in a squatting position
Personnel	women, family/hired
Relation to household system	women reported laundry as a daily task, usually 2-4 items, not allowing items to accumulate. Women reported that water course sometimes used when large items needed to be washed.

**Task: Sweeping**

Process	start from inner to outer area collect rubbish in one corner collect rubbish into container with the help of the broom and take away repeated more than once during day
Equipment	broom (short handled brush, approximately 1 yard length) container for rubbish
Work area	courtyard, inside rooms, verandah; courtyards vary greatly in size; dirt, or cement floors.
Body position	task carried out in a squatting position
Personnel	women, family/hird
Relation to household system	when milk was spilled, the individual merely swept excess milk around in the area, mixing with the dirt floor. Debris accumulates from animals and people walking through courtyard area throughout the day as well as from all the activities of daily living which occur within the family courtyard, i.e., cooking, cleaning vegetables, grain, laundry, eating, child care.

Task: Make roti

Process	<p>prepare fire in oven  take ground wheat (<u>abba</u>) and mix with water to  make dough  knead it for some time  let stand for 15-40 minutes  make small balls of the dough  take dry supply of ground wheat (<u>abba</u>) and place  the dough balls in it  flatten the balls out by using palms of both hands  and enlarge them  place them on the sides of a preheated mud oven  (<u>tandoor</u>)  take out with tongs when cooked</p>
Equipment	<p>utensil in which to mix dough  flat utensil on which to place the dough ball  mud oven (<u>tandoor</u>)  tongs  can also be cooked on a stove with <u>tawa</u></p>
Supplies	<p><u>abba</u>  water</p>
Work area	<p>cooking area (<u>tandoor</u> or <u>tawa</u>) in courtyard</p>
Body position	<p>may squat to mix dough  stand to flatten dough balls and to bake in mud  oven  if using a stove (<u>tawa</u>) a squatting position is  used since stove is no higher off ground than  about 1 foot</p>
Personnel	<p>women of the family</p>
Relation to household system	<p>task is a daily one. <u>Roti</u> are cooked for morning  meal and some report cooking a daily supply at one  time while others report preparing for each meal.</p>

**Task: Wash dishes**

<b>Process</b>	collect dirty dishes clean them using soap and/or sand or ash rinse stack and leave to dry
<b>Equipment</b>	containers for rinse water
<b>Supplies</b>	soaps, ash, sand
<b>Work area</b>	hand pump or tap in courtyard
<b>Personnel</b>	women, family/hired
<b>Relation to household system</b>	not likely to let accumulate due to limited number of utensils and space around pump.

**Task: Cook milk**

<b>Process</b>	prepare fire put fresh milk in metal container bring to boil over a stove place in a warm area--warmth is provided by burning of cow dung patties
<b>Equipment</b>	metal container source of heat for boiling and for storage
<b>Supplies</b>	fresh morning milk cow dung patties
<b>Work area</b>	courtyard area with source of heat--usually a mud stove
<b>Personnel</b>	family women
<b>Relation to household system</b>	this task is usually one of the first tasks mentioned by women to be done every day.

**Task: Make yogurt**

Process	combine morning milk left over during day with fresh evening milk heat to make lukewarm culture it with <u>lassi</u> and set in a mud baked round or flat utensil, overnight
Equipment	flat mud baked utensil or round mud baked utensil
Supplies	<u>lassi</u> , fresh milk
Work area	usually have designated place for storage of warm milk
Body position	must bend to reach heat source which is often about 1 foot off ground
Personnel	family women
Relation to household system	keeping milk left over from morning over low heat helps to keep down bacteria since no refrigeration is available.

**Task: Make ghee**

Process	take butter and place over heat source let cook slowly until <u>ghee</u> is separated remove from heat and store in mud baked or metal container
Equipment	cooking utensil source of heat storage container
Supplies	butter
Work area	cooking area in courtyard
Body position	must bend to reach heat source which is often about 1 foot off the ground
Personnel	family women
Relation to household system	task not reported as frequently by women. Used for <u>chapatti</u> and for seasoning vegetables. Can also be purchased.

Task: Make lassi and butter

Process	take fresh yogurt place it in the <u>ghara</u> (round mud-baked utensil) place in the churn and churn gradually adding cold water as desired churn until butter is separated from <u>lassi</u> season <u>lassi</u> with salt or sugar before serving
Equipment	round mud-baked utensil wooden churn
Supplies	fresh yogurt cold water
Work area	some area of courtyard
Body position	churning done while squatting on ground
Personnel	family women
Relation to household system	a daily task ,

**Task: Make cow dung patties**

<b>Process</b>	collect manure mix with straw shape into patties and place on walls, roofs, floors, ledges to dry also stacked and mudded over for additional storage
<b>Equipment</b>	none
<b>Supplies</b>	livestock manure and straw
<b>Work area</b>	outside the courtyard, usually where the livestock are kept
<b>Body position</b>	bending to collect dung and straw; standing to make patties
<b>Personnel</b>	women, family/hired
<b>Relation to household system</b>	major source of fuel laborers who don't own cattle are disadvantaged one reported getting from employer's cattle

**Task: Iron clothes**

<b>Process</b>	heat coals and place in iron smooth out washed clothes on the ironing area press with iron to remove wrinkles
<b>Equipment</b>	iron (electric) or coal
<b>Supplies</b>	electricity or hot coals
<b>Work area</b>	flat space (floor) and near electricity source if using iron
<b>Personnel</b>	family women
<b>Relation to household system</b>	a variety of items are not ironed; those ironed include <u>shalwar</u> , <u>qurta</u> , <u>kamiz</u> , embroidered cloths for chairs, table, shelves

**Task: Grind wheat**

<b>Process</b>	take all wheat grain to the grinding machine in the village or place small amount of grain in the grinding machine operated by hand and grind at home
<b>Equipment</b>	grinding machine containers for grain
<b>Supplies</b>	grain
<b>Work area</b>	courtyard/outside courtyard
<b>Personnel</b>	women/men
<b>Relation to household system</b>	most families reported grinding done by machine

## Task: Making tea

Process	boil water put tea leaves in teapot pour boiling water over leaves let stand boil milk (if necessary) serve with tea
Equipment	aluminum pot and cover source of heat
Supplies	tea leaves milk sugar water
Preparation area	cooking area in courtyard, or stove inside room
Personnel	women, family/hired
Relation to household system	very common activity for guests. Not as common for family.

**Task: Cook vegetables**

Process	<p>wash vegetables          peel (if required)          cut into small pieces          wash again          onions peeled and sliced thoroughly          onions browned in ghee          vegetables added          stirred for a couple of minutes          water added          salt, red pepper, tumeric, spices added          covered with lid and cooked</p>
Equipment	<p>mud baked <u>degchi</u>          spoon          containers for wash water and vegetables</p>
Supplies	<p>vegetables          spices</p>
Work area	<p>courtyard floor near heat source</p>
Body position	<p>work done in a squatting position</p>
Relation to household system	<p>Main food dish, prepared daily or twice daily,          choice of vegetables vary with season and          availability</p>

## APPENDIX E

## DAILY PATTERN OF FEMALE ACTIVITY

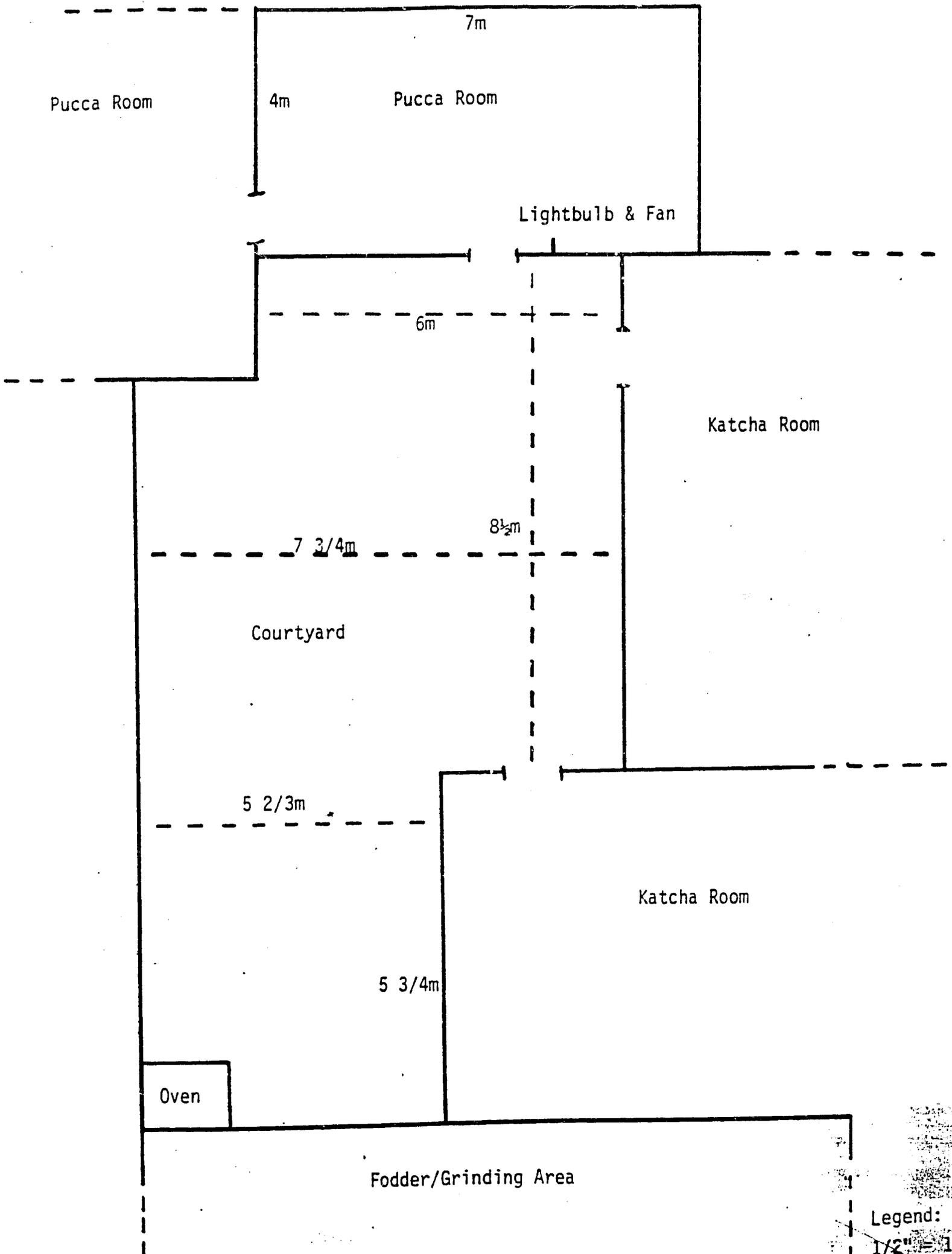
Before morning prayer	personal hygiene prepare for prayers
	Morning Prayers (4:00 a.m.)*
After morning prayers	meal preparation ( <u>roti</u> , <u>lassi</u> ) milk processing (yogurt, butter, ghee) lay out meal or take or send to field morning meal child care wash dishes sweep laundry cow dung patties livestock care supervise workers field work paid work rest occasional jobs
(around 9:00)	
(around 11:00)	begin noon meal preparation
(around 1-1:30)	lay out meal or take or send to field
	Noon Meal
(around 1-2:30)	afternoon prayers wash dishes rest occasional jobs leisure activities
Before evening prayers	get vegetables and/or start vegetable preparation for evening meal prepare for prayer
	Evening Prayers (5-5:45 p.m.)*
After evening prayers	continue meal preparation prepare for prayers
	Sundown Prayers (7:15-7:35 p.m.)*
After sundown prayers	lay out meal evening meal wash dishes culture milk get out charpies leisure activities

Night Prayers  
(8:15 p.m. until 11:45 p.m.)\*

Sleep

\*sometime during this time period

APPENDIX F



Legend:  
1/2" = 1'