

PN-AAX-036

IAN=49969

WOMEN AND WATER: EFFECTS OF  
IRRIGATION DEVELOPMENT IN A  
NORTH INDIAN VILLAGE

by

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February 1984  
Working Paper #50

Abstract: Anthropological fieldwork conducted during 1981 reveals some effects of irrigation on women in a northwest Indian village. The arrival of irrigation in 1954 marked the beginning of significant changes in the life of the villagers. Its benefits, however, have not been felt equally by women of different castes. Irrigation has increased household income, provided new employment opportunities, improved domestic water supply, and allowed women to maintain more productive livestock. This paper describes the different effects of these changes on upper and lower caste women both in a) on-farm agricultural labor; and b) domestic activities within the household.

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WOMEN AND WATER: RESPONSES TO IRRIGATION DEVELOPMENT  
IN A NORTH INDIAN VILLAGE<sup>1</sup>

INTRODUCTION

This paper considers a subject only recently beginning to gain attention among development planners--the impact of irrigation on rural women. The focus is a north Indian village in which anthropological fieldwork was conducted during 1981. Irrigation water was brought to the village in 1954 as part of a large-scale canal irrigation scheme, beginning a very new way of life for the local inhabitants. The paper discusses the impact of irrigation on: a) women's participation in on-farm labor, both paid and unpaid; and b) women's domestic activities, particularly food production and water and fuel procurement. It emphasizes the varying benefits of irrigation to women of different castes, for although irrigation has provided villages with new economic opportunities and resulted in greater economic security, its benefits have not been shared by women equally. Upper caste women have received the majority of the benefits.

Development planners concerned with food production frequently note the benefits of irrigation in increasing agricultural output. The World Bank budgeted 44% of its Indian loans to the improvement of water management systems in 1982. India has the most lengthy and sophisticated network of irrigation channels in the developing world. During the colonial era, the British constructed large scale irrigation works in the Punjab as part of their famine relief efforts. (For a good review of pre-Independence irrigation history see Paustian 1968). Today, the Indian portion of Punjab, constituting the states of Punjab and Haryana, is the country's most intensively irrigated and most productive region. Irrigation development continues to play a major role in India's agricultural planning.

The introduction of new irrigation schemes can have wide ranging effects on women's labor, some of which are noted in the existing literature. Most frequently, it is argued that an increase in household income (which irrigation provides) may draw women out of the paid agricultural labor force. For example, Sharma (1980) observes that in Punjab, increased prosperity throughout the 20th century, particularly since the Green Revolution, has been marked by the withdrawal of women from production. Dixon (1980:60) also has noted this phenomenon, writing that "successful agricultural projects that increase yields and household incomes in traditional purdah-observing societies may lead to the withdrawal of girls and women from the agricultural labor force to the more highly valued (and now affordable) practice of female seclusion."

Epstein's (1962) work, however, is perhaps the most detailed study of the impact of irrigation in India (Karnakata). While she does not discuss the impact of irrigation on women in detail, she does note that in the irrigated village of Wangala, village women achieved greater independence with irrigation through increased income from livestock raising. In the

unirrigated village, women had to depend on their husbands who obtained a new source of income from wage work in the nearby town. In her example, irrigation has been a benefit, rather than a curse, in generating income for women.

Finally, Cloud (1982) in a discussion of irrigation in South Asia, indicates that the increased farm income from irrigated agriculture draws women into unpaid household production. She cautions, however, that an increase in family income provided by irrigation may improve the total welfare of the family (e.g., better food and housing), but at a cost of greater female dependency on male earners.

Despite the dramatic changes that frequently occur with irrigation development, very little is yet known about: a) the role that women play in water management within traditional agricultural systems; b) the differential effects of irrigation development on men and women (Cloud 1982); and c) the differential effects of irrigation development on women of various caste groups. This paper presents a single case study focused only on the last of these topics. Though the present data are specific, it is hoped that the problems posed and the lessons learned might have broader relevance.

The paper is based on research conducted almost thirty years after irrigation had been introduced and its consequences had been felt by all villagers. It therefore can only reconstruct what life for village women must have been like before the arrival of irrigation. With these methodological constraints in mind, the paper emphasizes the varying ways in which women of different castes are currently benefiting (or not benefiting) from irrigation. To anticipate the findings, irrigation has provided increased food security for all households; village women have easier access to water for washing and drinking and the cash income of their households has increased. Nevertheless, though the overall impact of irrigation appears to be positive, not all women have had the same experience with development planning.

#### THE RESEARCH SETTING

Bagarpur is a small village of 748 people (395 males, 353 females), located on the Haryana side of the Haryana-Rajasthan state border. It is on the northern periphery of the Thar desert with an average annual rainfall below 300 mm. Shifting sand dunes dot the sparse landscape, yet despite the extremely sandy soil and arid climate, agriculture dominates the regional economy. Although some agriculture has always been possible, irrigation now permits an agricultural security not previously known.

The study village is part of a region known as Bagar, a term which loosely translates as "wasteland." The Bagri people are thought to have originated in Rajasthan and, linguistically, the Bargi language is a dialect of Hindi. All Bagarpur villagers, with the exception of one family, are Hindus.

The village is dominated both socially and politically by a few older, larger, and more established clans. Formal village government is almost non-existent. A village panchayat (group of five locally elected officers) theoretically mediates disputes and carries out community-wide services such as maintenance of the village pond. Legally, one woman retains a seat in the panchayat. Nevertheless, during the time of fieldwork, the panchayat was highly ineffective and villagers did not even know who the elected woman was.

### Research Methods

Anthropological fieldwork was conducted during a ten-month period from January to October 1981. A total of six months was spent living in Bagarpur village, conducting interviews with women and participating informally with them in their work in the fields and in the household. Detailed information was gathered from 40 households (40% random sample) and oral histories were gathered from all households. This paper draws on knowledge of women in the village as a whole, since time was spent working with women not included in the sample and periodic daily work schedules were gathered from women throughout the village. These schedules proved extremely useful in balancing out the discrepancies between what women say they do, what men say women do, and what women actually do.

Methodologically, this study was synchronic and only by talking to older informants and examining historical records, could I understand what sorts of changes had taken place in the lives of the villagers. In addition, household histories provided an excellent way of looking into the past.

### The Sociocultural Setting

Caste. Bagarpur is a multicasite community, but is dominated by one upper caste known as Jat (table 1). Jats were traditionally, and continue to be, peasant farmers and are known throughout northwest India for their hard work as cultivators. The Siami (6 households) are a caste of farmers considered by the villagers to be equal in status to Jats. For the purposes of this paper, the two groups have been combined. The other major cast group within the village is the Harijan which is spread among three different castes: Chamar (leather workers), Dhanak (weavers) and Cheurda (sweepers).<sup>2</sup> Neither the Chamars nor the Dhanaks perform their traditional occupations, but rather are involved in wage labor, predominantly in agriculture. The single Cheurda family continues its traditional occupation, handling dead animals and funeral preparations. Within the caste hierarchy, such work is considered the most polluting of that done by the low castes. A variety of service castes also are represented in the community, including a Brahmin priest who performs marriages and funeral services, a goldsmith, a blacksmith, two carpenters and a barber. Members of the service caste are not considered to be polluting by the Jats and perform specialized and technical services.

To the reader unfamiliar with India, the relationship between castes may seem confusing. The hierarchical ordering of castes in Bagarpur is not always clear-cut. Nevertheless, the three major categories (Jat/Siami farmers, Harijans, and service caste) provide a framework for understanding village relations.

Differences between Jat/Siami and Harijan households strike the visitor immediately on entering Bagarpur. Harijans live in a cluster of small mud houses at one corner of the village. Children appear less well fed than their Jat/Siami counterparts and their clothes are often old and tattered. Jat/Siami houses, in contrast, are frequently made of fired brick construction and contain elaborate entranceways with a room for livestock at the front door. One then enters into a large courtyard, surrounded by small storage and living rooms. Of course, not all Jat/Siami households are equally wealthy, but the distinction between Jat/Siami and Harijans is prominent.

Landholdings. Bagarpur is a village of farmers and few other opportunities for employment are available. Wealth is measured in land and to be landless is to be poor. Landholding categories tend to mirror caste distinctions to a large extent. The landed are mostly Jat/Siami; the landless agricultural laborers are mostly Harijan; and the landless specialists are service castes.

No perfect match between caste and landholdings exists, but the general pattern is quite obvious (Table 2). Because the service castes derive a significant portion of income from their trades, they are not considered in this paper. Rather, the focus is on Jat/Siami and Harijan women, since their experiences most dramatically illustrate the role of land ownership, wealth, and caste in determining the impact of irrigation on women.

The Family. Villagers adhere to customs of patrilocal residence, patrilineal inheritance, and village exogamy. Thus, women come to their husbands' village as outsiders. Most frequently, a new bride joins an extended household in which a group of brothers and one or both of their parents are living under one roof. Her position as a new bride is a highly subordinate one and, as is often noted in the literature, the burden of household chores is placed most heavily on her.

The composition of the household has a strong impact on the division of labor and subsequent role of women. As in much of north India, the ideal family type is the joint family in which two or more brothers share agricultural, and their wives domestic, work. This ideal, however, is seldom realized and at any one point in time, a variety of family types are evident in the village (Table 3).

The mean household size of different caste groupings at the time of fieldwork can be seen in Table 1. Some households, however, included as many as 16 or 18 people. The desire to have sons overrides the decision to have small families. A couple may continue to have daughters (despite

exorbitant dowry costs) until one or two sons are born. Sons, in general, are more highly valued than daughters since they will remain in the village, inherit the family property, and care for parents in their old age. Daughters, in contrast, are active members of the household only for the first 15 to 18 years of their lives, hence the term "other's wealth" (praya dhan) used to refer to them. Nevertheless, a young unmarried daughter frequently contributes more toward household labor than does her brother, since he tends to continue his schooling while she works in the fields and does domestic chores.

Purdah. A bride entering her husband's village observes purdah, a custom that implies a set of prescribed behaviors for a woman's interactions and activities. In Bagarpur, the most obvious way in which this ideal mode of behavior is realized is by veiling the face in the presence of male elders and in public places. Purdah also involves not speaking to elders, particularly a father-in-law and a husband's elder brothers. Purdah restrictions are observed with all village members who occupy the role of elder male; i.e., those who command deference and respect. Nevertheless, as a woman gains status in the village with age and adult sons, purdah restrictions frequently become more relaxed, particularly if she is widowed.

The system of purdah functions to limit women's participation in politics and public events. Women are never seen in the public streets talking or loitering; these are the places where elder men sit, talk to neighbors, play cards, and smoke hookah. Women rarely speak with district officials passing through the village (for example, the tax authorities, officials from banks or credit associations, and irrigation officials) and rarely visit the district center except to visit the doctor when their children are ill. They do not leave the village to purchase household goods and claim they see no need to do so. Husbands and children perform these tasks. While a recently introduced bus service to the district center does provide younger women with opportunities for frequent contact with the world outside the village, the basic system shows few signs of changing.

Purdah, however, in no way restricts Bagarpur women from agricultural work or chores requiring a woman to leave the confines of the households. In fact, a value placed on hard work accompanies purdah. In other parts of north India and among other castes, purdah ideals dictate that women should not leave the confines of their house compound. In Bagarpur, however, women are not secluded within the confines of the household. The notion of deference and respect to elders implies that a young bride will work hard in the household and not be lazy, particularly in front of her husband or a village elder. Women show an outstanding endurance, working a full day in the fields and returning home to carry water, cook, and care for children, all as a matter of their female existence and with the knowledge that this work will one day be assumed by a daughter-in-law.

Despite the government's attempts to legislate change, then, exogamous, patrilocal marriage practices and purdah restrictions ensure that men dominate the public sphere. Women in Bagarpur do participate in work outside the household, but purdah prevents their involvement in politics and public events; these are all arts of a man's world. Life is changing in Bagarpur, but at a slower pace for women than for men.

Property Inheritance. While legally a daughter has equal rights to inherit family land, the de facto practice of land transfer is partible inheritance to sons. Frequently, a family holding more land than the maximum number of acres allowed under the Surplus Land Act designates a daughter as legal property holder, particularly if no sons are of legal age. Nevertheless, the title to property has little significance. Women leave their natal village at marriage and any claim to land is passed to a brother or other male relative. To demand money for land within the family is culturally unacceptable and transfer of land to sons goes unquestioned.

In the event that a woman's husband dies, she becomes heir until a son comes of age. A widow without a son is at a disadvantage both socially and economically. For example, one elderly wealthy widow in Bagarpur had no male heir. Her land was classified surplus under the reform laws but because she had no son she lacked the clout and social ties with male officials to have her surplus land overlooked, as other wealthy male farmers generally did.

### The Economic Setting

Irrigation History. Irrigation water from the Bnakara canal arrived in Bagarpur in 1954, and, in combination with other events, resulted in sudden and rapid economic and demographic growth. Under the Surplus Land Act of 1952, absentee landlords were forced to sell their land within the Bagarpur boundary. This surplus land was redistributed to poorer families already living in the village and sold to families who subsequently migrated into the village. (Farmers displaced by the partition of India and Pakistan in 1947-48 were seeking land and Bagarpur was an attractive location.)

Prior to the early 1950s, the population of Bagarpur was relatively small and consisted primarily of Jat households. Only two Harijan households resided in the village. A full village census conducted by me and my colleague during 1981 revealed that nearly half of the 1981 households in the village were the result of fissioning among families who had migrated into the community during the irrigation period (table 4). As the data indicate, many of these households were landless and have remained so. They came to Bagarpur seeking new employment opportunities and found them in agricultural wage work and service work. Prior to irrigation there was little need for agricultural wage work and little extra income to pay for services.

At present, roughly 80% of the village agricultural land is irrigated. While canal water has increased agricultural security, water is not always available because Bagarpur is at the tail end of a system that begins far

away in the Himalayas. Further, tubewells which tap the ground water are rare in Bagapur since the water table is deep and often saline. Accordingly, although the Green Revolution that has changed much of Punjab and Haryana also has changed Bagarpur, the transformation there has not been as great.

Agricultural Practices. According to older informants and genealogical information, the whole Bagar region was sparsely populated before irrigation. Agricultural work was minimal and sporadic, and farmers depended on rain to grow crops. Frequent droughts and crop failures under dry farming conditions made farming undependable. Chick peas, barley, millet, pulses, and small quantities of oilseed were grown when soil moisture was adequate. Due to lack of water and inadequate fodder crops, water buffalo were seldom kept. Livestock, thus, played a central part in the economy and cattle and small stock were grazed on the open land.

With the arrival of irrigation water, farmers intensified production of traditional crops and began cultivating new crops requiring irrigation. Wheat was introduced as a significant spring (Rabi) crop for cash and home consumption. Cotton was introduced as a fall (Kharif) cash crop. Additionally, chick pea production increased tremendously. While Bagarpur farmers are still largely subsistence farmers, the increase in these crops, both in yields and acreage planted, has increased their involvement in the cash economy. Total cropping intensity has increased from 49% to 109% since the 1940s.<sup>3</sup>

Fertilizers and high yielding varieties also are a part of agriculture in Bagarpur as a result of the Green Revolution. Mandelbaum (1975), in a discussion of the impact of the Green Revolution, suggests that labor is displaced when agriculture is modernized and that this displacement may be most harmful to poorer households which depend on wage labor as a source of income. Bagarpur, however, is relatively unmechanized. Tractors are few (three in 1981) and combines do not exist. Consequently, labor has not been displaced to the extent that it has been in the more fertile and productive regions of Punjab. In fact, the opposite appears to have occurred; demands for both male and female labor have increased.

Water Management. Under the current system of canal irrigation, water channels are managed by the shareholders whose land is serviced. The number of shareholders varies from 20 to 85 and may include farmers from different villages. Since the organization of the Haryana State Minor Irrigation and Tubewell Corporation (HSMITC), began in the 1960s, the shareholders' role is limited to keeping the irrigation channels clean. HSMITC builds and services the watercourses and provides a legal forum for disputes if necessary.

When channels need cleaning, the farmer most affected notifies his neighbors and a time for cleaning is set. The decision is then passed on to the other members. There is no regular leader. One member of each shareholder's family is expected to work for a day. Women play no role in

the maintenance of channels and no role in the formal management of the irrigation system. In fact, most of the management decisions are carried out at the state level, although shareholders are repaying a subsidized loan to the state which will transfer title of the watercourse from HSMITC to shareholders. When title is transferred, the shareholders will once again be responsible for repairing and, if necessary, replacing the channels.

Other Developments. The government of Haryana has made considerable effort to provide services to the rural areas. As a result, Bagarpur is linked by paved road to a district center, 25 kilometers distant. There is direct bus service four times daily. Electricity was introduced in 1971 and two commercial flour mills, which use electric power for grinding and chopping fodder, are located in the village. At the time of the fieldwork, 20% of the houses were electrified (all but one belonged to Jat families). Nevertheless, there were no electrical home appliances, such as fodder chopping machines, home flour grinders, or ghee makers in the village, although one Jat household was considering purchasing a ghee maker. Bagarpur may soon witness the introduction of such labor saving devices, but the costs of purchasing equipment are high and many families cannot afford them.

An extremely important development in the village was the establishment of a primary school there in 1964. Most boys, particularly Jats, graduate from it and many continue their schooling at the high school 2 kilometers away. Education for girls, however, remains minimal (Table 5).

#### IRRIGATION'S IMPACT ON FEMALE AGRICULTURAL LABOR

Among upper cast Jat/Siami women, degree of participation in agricultural labor tends to depend on wealth and household composition. Among upper caste Jat/Siami women, degree of participation in agricultural labor tends to depend on wealth and household composition. Withdrawal from agricultural labor is a sign of prestige and adult married women are less involved in agricultural work in households able to afford wage laborers. Nevertheless, during the highly demanding harvest, most able women do some work in their family fields. Jat/Siami women do not participate in wage labor for other families. Even the poorest and landless Jat woman did no wage work in the village, although she was willing to migrate out of the village seasonally for work.

The pattern is quite different among Harijan women. They tend to work for daily wages in landowners' fields. Frequently, they are indebted to work for Jat and Siami families due to loans incurred during the slack season and have no option but to work. The working relationship a Harijan woman establishes with a Jat/Siami household is often one that is cemented over the years. Services provided throughout the year may be returned by the Jat/Siami household in the form of old clothing and extra food as well as cash wages and loans.

While very few sources of employment for Harijan landless women are available, agricultural labor is an important source of food and cash. Field data show, however, that Harijan women were underemployed during the 1981 harvest season. (Table 6 contains data indicating the number of days worked by a sample of Harijan women during harvest.) Village landowners hired labor from outside the village and village women worked less than half the harvest days of the season. The full potential of the local female labor force, then, was not being tapped. Landowning families may have preferred to hire men, although female labor was hired from outside the village. Conversely, local Harijan women may have chosen not to work and relied on their husbands' income as wage workers because non-employment as a wage laborer accorded a degree of prestige. This proved to be a sensitive topic; while women as well as men complained about working for others, they never complained about the lack of employment. Yet, there generally are long periods between harvest when women in particular have no steady source of employment.

#### Agricultural Tasks Performed

Jat/Siami and Harijan women both engage in weeding, harvesting, hand threshing, and winnowing. As a rule, they do not participate in the preparation of the land (plowing, levelling, sowing, and irrigating). In addition, they do not handle machinery, such as the tractor or tractor powered thresher, which is restricted to men.

Among both Jat/Siami and Harijan women, work in agriculture does not begin until around age 11. Younger girls not attending primary school help with household chores, but rarely go to the fields. Between the ages of 11 and 15, girls work hard both inside and outside the home. At age 15 or 16 a girl is married and begins spending the non-harvest season in her husband's village. A girl's transition into her husband's village is very gradual and for the first few years, she returns to her natal village for one if not both harvests, depending on labor requirements. It is expected by both her in-laws and parents that she will return home frequently, particularly if additional labor is needed.

After a woman reaches about age 40, she frequently may retire from agricultural work, particularly if she has children to assume the responsibilities. Among Harijan women, wage work frequently is extended until ages 45 to 50, despite the labor provided by children. Each added hand is a source of cash and other benefits. Nevertheless, degree of agricultural labor participation is a function of a variety of factors including household compositions, wealth, and health.

Weeding. While some unirrigated fields are occasionally weeded, the majority of weeding takes place on irrigated land. Cotton, an irrigated crop, requires the most weeding labor. While both men and women do some weeding, hoe weeding is primarily a female activity. Jat/Siami women also help in weeding as they gather fodder on a daily basis, selectively cutting the smaller weeds and grasses for fodder. When one farmer was asked why he

had let his cotton crop get so full of weeds, his reply was that his wife was letting the better fodder weeds grow so that she could harvest them as food for their livestock. Harijan women, lacking land, have less opportunity to collect fodder in this manner, but may do so if permitted by land holding families.

Harvesting. Women, both Jat/Siami and Harijan, participate in all harvesting, although their degree of participation varies with the crop (Table 7). Fodder harvesting, particularly of clover (green fodder) is done primarily by women and children. Irrigation has permitted a large variety of new fodder crops to be grown, crops whose quality is better for supporting livestock. A great deal of time and energy is devoted to fodder crops since livestock play a central role in the village economy.

During the fall season, women contribute more to agricultural labor due to the type of crops grown and the cooler weather. Cotton in particular is harvested primarily by women and children since it is considered relatively easy to pick and overlaps with the more rigorous cow pea and millet harvesting, primarily done by men. Even Jat/Siami women, who generally do not work in the fields, invariably do some cotton harvesting. Young children begin their agricultural careers by working along side their mothers in the cotton harvest.

During both the fall and spring seasons, all land owners interplant melons and squashes with their primary crops. This supplemental planting is done very casually (hand-broadcast) and unsystematically, but the crops provide a welcome variety to the routine diet at harvest time. Harijan wage workers are free to eat melons and squash during the harvest while working in the fields.

Threshing. After the crop is harvested, it either is taken to the village for threshing or threshed near the fields. Wheat is threshed by machine and, thus, is never done by women. Cotton is sold before it is ginned. Chick peas, millet, and oil seeds are first crushed by guiding camels around in a circle over the stalks, then threshed and winnowed by hand using large pitch forks. (The chaff is saved and used for fodder and fuel.) This work is done by men and women together.

#### Summary: Impacts of Irrigation by Caste

Jat/Siami Women. The most apparent impact of irrigation on Jat/Siami women's role in agricultural production is an increase in agricultural work during the harvest season. Cotton in the fall and wheat in the spring have increased both the demand for harvest labor and the total harvest seasons. Cotton and wheat also have affected the scheduling of crop harvesting and consequently the amount of labor required at certain peak periods. For example, the harvesting of cotton overlaps with that of millet, requiring household labor to be divided among two fields.

Changes in agricultural labor brought about by irrigation have been in degree rather than in kind. According to older informants, Jat/Siami women traditionally worked in the fields, but their participation has increased, at least for the present. This increase can be attributed to more intensive and relatively unmechanized farming practices, greater stress on crop scheduling, and a longer harvest season.

Cotton in particular has brought women and children into agricultural work, since it is a relatively easy crop to pick. Irrigation has had a minimal effect on female involvement in threshing and winnowing operations. Cotton is ginned outside the village and wheat is machine threshed. Hence, women's participation in this sphere is limited. Whether Bagarpur agriculture will become increasingly mechanized and women relegated to the home remains to be seen.

Irrigation and the Green Revolution have made agriculture more secure in the Bagar and have brought a new source of income to village landholders. Farmers have been quick to adopt some of the changes. Irrigation has been a boon to those families owning sufficient land. Inequities among Jat/Siami households persist, however, and not all women have shared in the benefits of irrigation.

Harijan Women. Irrigation has provided a source of income and/or a source of food for Harijan families. In addition to cash wages, the laborers are free to take vegetables, fruits, and grains to eat during the day. Harijan women also are allowed to cut weeds as fodder for their livestock and, when working, are usually given one meal during the day's work. Those Harijan women who have secured good working relations with Jat families also can collect cotton, chick peas, wheat and millet after the landowners are satisfied with their harvest. The work is time consuming and the benefits may seem meager, but this activity can be a very important source of food and cash for poor and landless households.

The benefits of agricultural wage work are of a slightly different nature for women than for men. Women work on a daily basis, rather than on a monthly or yearly contract as men often do. Thus, they have more flexible schedules. Prior to irrigation, little agricultural wage work was available. Irrigation has brought about both a demand for and a supply of Harijan wage laborers and service castes. Whether the Harijan migrants were less advantaged in their place of origin is not known. Today, however, Harijan women make up a relatively small percentage of hired agricultural wage labor. While in part, this may be due to land owners' preferences for male laborers, the prestige of not working also appears to enter into the relationships.

With the exception of harvest work, few opportunities exist for Harijan women. Harvest wage work has reinforced caste distinctions between landowner Jat/Siami and Harijans. The traditional occupations performed by Harijan castes are not performed in Bagarpur, but Harijans have become wage workers and are defined as such. Despite the indirect benefits to the

Harijan family, wage work reinforces the Harijan's dependency on the landed through indebtedness. Increasing mechanization, in combination with a growing population, however, will most likely force Harijans to seek work elsewhere as the village labor surplus expands. For both economic reasons (employers prefer men) and factors of prestige, women are likely to be the first to be squeezed out of agricultural wage work.

#### IRRIGATION'S IMPACT ON FEMALE DOMESTIC LABOR

Despite participation in agricultural production, a woman's primary role is as a worker within the household. Irrigation also has had a strong impact on women's domestic tasks.

##### The Jat/Siami Work Day

A Jat/Siami woman's day begins before sunrise. She first churns the milk into ghee, a task requiring about an hour. Then, she cleans the house, milks and feeds the buffalo and/or cow, prepares food for the family and laborers, brings water from the village pond, and makes dung cakes to dry in the sun. She may bring food to the fields and return home with fodder and/or fuel. If she has free time in the afternoon, she may spin cotton or grind chick peas or millet on the hand flour mill. Toward evening, she again cares for the livestock, carries water, milks, and prepares food. Finally, after the evening meal, she may help chop fodder on the hand chopper and feed the animals.

Jat/Siami women visit their natal village once or twice a year for a period of up to a month once they have become permanent residents in the village (e.g., after the early years of marriage). When they are pregnant, they return home for periods of up to six months and give birth in their natal village. These visits are periods of relaxation from the daily work load in their married home and women look forward to them eagerly.

##### The Harijan Work Day

The Harijan woman's work day in the home does not differ in kind from that of the Jat or Siami. Lacking the amenities common to Jat/Siami households, however, the Harijan woman has fewer tasks to perform around the household. Most Harijan have few dairy animals and seldom have surplus milk requiring ghee preparation (Table 8). Since many Harijan families own sheep and goats which graze near the village, fodder collecting is not required. If a cow is owned, women and children gather fodder grasses along the roads near the village or collect fodder in fields of Jats with whom they have good relations.

Home flour grinding is done infrequently since most Harijans do not have a regular supply of chick peas and millet. Wheat is frequently purchased on credit from Jats and is ground at the electric flour mill. Cotton spinning, a common pastime among Jat/Siami women, is rarely done by Harijan since they lack the cotton with which to make thread.

Visits to their natal village are much less frequent among Harijan women than Jat/Siami. Harijan women cannot afford the bus fares and gifts required, and, as a result, are lucky if they can return once a year. Nevertheless, they do return home when they are pregnant.

Harijan women frequently seek work in the homes of Jats, but such employment is sporadic. (Harijan women rarely perform such work within Siami households.) They clean, plaster the homes with mud, and act as midwives, but do not cook since this is considered polluting to Jats. Cleaning and plastering are performed during weddings, funerals, and other ceremonial occasions. Harijan women are not paid in cash, but instead receive old clothes or grain for their labor. Additionally, they may receive extra buttermilk from the Jat day's ghee making. These services are important to Harijans since they tide the household over between harvests.

#### Food Preparation and Consumption

Irrigation has brought about changes in diet which are reflected in changes in work patterns. After irrigation, wheat began to replace millet as the staple grain for making chappattis (flat bread). Villagers claimed that long ago, they ate barley and chick pea chappattis, then shifted to millet and now increasingly use wheat.

The Jat/Siami diet generally consists of two meals during the day, that include chappattis, ghee, a thin curried vegetable, and buttermilk. Women are strict vegetarians while some men infrequently purchase meat from the district center and prepare it themselves outside the home. In Harijan households, the diet consists of chappattis and perhaps a chutney (made from chilis); vegetables, which must be purchased, are rarely eaten except during the harvests.

An important feature of the introduction of wheat into the diet is that it can be ground at the commercial flour mill. Village women prefer to grind millet in the home just before eating since it spoils quickly. Wheat, however, is rarely ground at home, greatly decreasing the total time spent in hand grinding. The increase in chick pea production has not significantly altered the pattern of food preparation or consumption. Village women continue to hand-grind chick peas since they claim the commercial flour mill cannot grind the flour as fine as they would like. Despite irrigation, chick peas retain their central importance in the agricultural economy.

Many of the foods grown in the village are not available to Harijans. Chick peas may be obtained from the leftover harvest in Jat/Siami fields and wheat is bought on credit from landowners with whom the Harijans have good relations or from the village shop. (Prices tend to be higher in the shops, however). Thus, the benefits of irrigated crops and increased production of indigenous crops have not affected the diet of the Harijans as significantly as that of the Jat/Siamis. Securing good relations with Jat/Siami farmers is the best means of improving the family's diet under the current system.

Of all food items, milk and milk products are the most highly valued by the villagers and make up an important part of the diet, both nutritionally and for social and ceremonial purposes. Villagers claim that prior to irrigation they were more dependent on milk due to uncertain crop yields under dry farming conditions. But by animals, however, continue to play a central role in the lives of the villagers. Milking and processing butter into ghee are primarily women's tasks.

Milk is rarely sold. Surplus milk is made into ghee which is sold both within and outside the village. Women are responsible for the supply and sale of ghee within the village. Often men are unaware that their wives sell ghee and rarely know how much surplus is available in the home.

Irrigation has increased the security of and dependence on grains and pulses, but milk and ghee remain the most important food items in the villagers' diet. Harijans, however, eat milk products infrequently. Irrigation has permitted villagers, particularly Jats and Siamis, to maintain water buffalo which produce a much higher quality and quantity of milk than the local variety of cow.

#### Fuel Use

The primary sources of fuel available to Jat/Siami women are cotton sticks, dung, and occasionally dead branches of trees. Cotton sticks are used primarily for cooking chappattis on the hearth. Slow heating for processing milk and fodder on a clay oven is done using dung cakes.

Dung remains an important fuel source and all families (whether Jat/Siami, Harijan, or service caste) have at least one small dung pile. Dung is mixed with straw and made into cakes which are dried and stored to be used as needed. Dung is increasingly used as fertilizer. It also is used to make fired bricks for wealthier homes, decreasing its availability for home use. Cotton sticks, however, have filled this gap.

Jat/Siami women rarely expressed problems of fuel shortage. During the months of September and October, cotton sticks are scarce until the harvest. When the sticks are depleted, women gather dried stalks of chick peas, mustard, and cotton from the previous season. While the process is time consuming, the shortage is only for a few months. No Jat/Siami women reported any critical problems in finding fuel on their own fallow fields.

Fuel is an acute problem, however, for Harijan families. They either must purchase wood on the market, if cash is available, or depend on gifts of dung from Jat families, resulting in increased social, if not economic, indebtedness. If these sources of fuel are unavailable, Harijan women seek roots and dead shrubbery along the roadside. All Harijans, as well as Jats/Siamis, have some dung, though Harijans may not have cows and buffalo. Since the animals are stall fed in the Jat/Siami homes, Harijans can only gather dung when the animals are taken out of the stalls occasionally.

Since the arrival of irrigation, vacant land available for fuel gathering has decreased. The landed, however, have been more than compensated due to the introduction of cotton. Jats and Siamis can gather enough fuel to last throughout most of the year on one acre of cotton-producing land. The landless Harijans, in contrast, have received no natural benefits; public land is a scarce commodity and Harijans must spend time searching for fuel wood or purchase it from the landed.

### Livestock

All landowning families own livestock, usually one camel (for plowing and transport), one or two buffalo, and perhaps a cow. Villagers consider their animals on a par with land and sons; they are an indispensable part of life. Although all family members care for livestock, women play a more prominent role in feeding, milking, and general maintenance of dairy animals while men tend to care for camels.

Livestock are stall fed during most of the year. Buffalo, while producing milk, are fed a mixture of cottonseed (purchased on the market) and chick peas, in addition to grasses. This combination is said to increase milk yields and fat content. The amount of time required to prepare the fodder is quite extensive; a woman first cleans out the better chick peas for human consumption and splits the peas on the hand mill. The seeds are then heated during the day to soften before being fed to the milk producing buffalo.

Goats are to the Harijans what cows are to the Jats and Siamis, a back-up for the primary milk producer (water buffalo), and in the worst of times, the sole source of milk. Goats are grazed along the roads and ditches and in communal acreage near the village. Harijan women and children are responsible for care of the small stock, milking them, and gathering fodder. While grazing land along the irrigation channels is good, the problem of food to maintain animals is a key issue.

Irrigation has permitted Jats/Siamis to keep water buffalo, which need a sufficient amount of water in which to puddle daily. Irrigation also has permitted fodder crops; e.g., clover, millet and cow peas necessary for the maintenance of buffalo, to be grown. Harijan households lack the necessary capital to purchase buffalo and cows and cannot produce enough fodder to maintain them. As the land has become more intensively utilized and vacant acreage has become scarcer, Harijans are finding less and less room on which to graze their small stock. The final result is a lack of dairy products in the Harijan diet.

### Domestic Water Use

Villagers obtain water for drinking, washing and cooking from a single village pond. The pond consists of a drainage area which is fed by irrigation water as needed. There are no wells or piped water available due to problems of political organization within the village.

Village women carry water from the communal pond in large clay pots twice daily and each pot takes about 15 minutes to fill. Water carrying is symbolic of women's work; as a bride first enters the home of her husband, she is greeted at the door by her mother-in-law who places a pot of water on her head, symbolizing the work she will have to do in her new home. After childbirth, a woman does no work for a month but her reentry into the household is marked by a ceremony in which she takes her first pot of water from the pond. The pond is a focal place for women to meet and talk and information flows rapidly among village women there.

Prior to irrigation, whenever the village pond, then fed by rain water, went dry, women walked three kilometers to the next village for well water. The more permanent water source in the village has benefitted the poorer segment of the population especially, as was witnessed during fieldwork when the irrigation channel was closed temporarily for repairs. Wealthier families sent their sons on camels with water tanks to get water from the neighboring village. Poor women from households not owning camels had to go on foot. Irrigation also has relieved all women of having to carry water to the fields since now most farmers have easy access to water either in the irrigation channels or in small storage tanks.

#### Cotton Spinning and Weaving

Cotton spinning and weaving are done in spare time by wealthy young women and upper-caste older women who do not engage in agricultural work. A portion of the cotton harvest is saved and ginned for home use. Thread is spun by hand on wooden spinning wheels. The men make this into string, some of which is dyed and woven into colorful rugs by the young women of the household to use as part of their dowries.

Cotton thread and the crafts produced are not sold, but rather are used in the home. Only Jat/Siami families who grow cotton engage in these tasks; Harijan women do not have access to the cotton lint. Harijans occasionally may sell goat hair, but do not use it for spinning in the home.

Spinning and weaving are considered leisure activities and are carried out during the non-harvest season and by elders. It is difficult to measure the degree to which leisure time has increased for women with the coming of irrigation, but it appears that irrigation development, coupled with other modernizing forces, has increased agricultural labor requirements while decreasing household work, particularly for the landed. Clearly, factors such as family composition, size, and sex ratio, as well as agricultural changes, all influence the degree to which women have leisure time.

#### Barter and Cash

Bagarpur remains primarily a subsistence agriculture village, despite the increase in cash cropping. Barter exchange is an important part of the village economy as a whole, particularly for women. Grain frequently is exchanged for vegetables from peddlers or from small village shops. While

men are involved in cash transactions when marketing their produce, women and children tend to play a greater role in the barter exchange system within the village.

Harijan women prefer to exchange their services for durables rather than cash. Those hired to work in Jat/Siami households prefer to be paid in grain or clothing since cash is turned over to the household head who may spend it on drink or gambling. Payment in kind assures the family of food and clothing.

Wheat and other grains frequently are "purchased" with labor. Harijan families work for the seller during the harvests and the cost of grain is calculated against work days. In this manner, the cash transaction is eliminated. Jat women are less involved directly in the barter economy than Harijan women. The one area in which they may be involved in cash is in the sale of ghee. Most women also receive small amounts of cash which they use to buy bangles or ribbons.

It was difficult to discover how cash is spent within the household economy since the topic was sensitive among the villagers. Nevertheless, although no data were collected on exact allocation of cash, observations indicate that women retained little control of cash income. Often, cash and cash loans would be spent on alcohol and gambling by men.

### Summary

Traditional cooking methods continue to be used by women, but changes in cropping patterns have brought about some changes in diet and fuel consumption. Wheat is replacing millet as the staple grain, but the transition has been slow. Chick peas remain an important food as well as cash crop. Irrigated farming has introduced new varieties of fruit and squash into the diet seasonally. The introduction of cotton has replaced wood gathering for the Jat/Siamis. The increased use of dung as fertilizer and for firing bricks has meant a decrease in its use as a cooking fuel.

Milk and ghee remain the most important food items for the villagers. Despite the high costs of fodder, milk products remain popular and their nutritional and prestige benefits far outweigh their cost in the villager's eyes. Poorer families, particularly the Harijans, do not have access to many milk products because they lack the necessary capital to invest in dairy animals and have no means of providing fodder.

Access to leftovers of the harvest provide grain and pulses for Harijans, but the landless continue to buy grain from landed families or in the local shop or district center. Purchase of grain and other food items within the village brings the Harijan family into a series of economic relations with and obligations to Jat/Siamis. These relations assure the Harijan family of food on a daily basis during the work season and loans during the off-season.

The decrease in time required to maintain the household has been complemented by an increase in agricultural work. Household labor requirements have decreased in the areas of water, fuel, fodder procurement, harvesting, and grain grinding. Although the decrease in household work does not necessarily mean an increase in agricultural work, this tends to be the case, particularly among the less wealthy families who cannot afford to hire wage workers. Jat/Siami women's participation in agricultural work may affect Harijan women negatively since their labor is in the least demand. If such is the case, encouraging time-saving devices as steps towards modernization may result in even greater agricultural unemployment for Harijan women.

At present, however, few modernizing time-saving devices have entered village households. No women have electric ghee makers, fodder choppers, or grain grinders. The traditional wood burning stove continues to be the only type of stove. Water is carried from the pond and traditional home cooked foods are preferred to commercial foods. Women and children perform the bulk of household work while men either work in the fields or relax in the village.

#### CONCLUSIONS

Irrigation has brought about major changes in the life of Bagarpur residents. Specific cultural patterns of labor allocation within the household and among different segments of the population in large part have determined the direction of change. The future may witness a situation paralleling Sharma's (1980) in which women are drawn out of the labor force. To date, however, there is little evidence of this, perhaps because farming is still relatively unmechanized in Bagarpur. The impact of irrigation, however, has been felt in different ways by women of different castes.

a) Irrigation has made possible an increase in cropping intensity and scheduling, thereby raising landed women's participation in agricultural work. Since landownership and wealth tend to follow caste lines, these women usually are Jat and Siami. Landless Harijan women, however, now engage in agricultural wage work, although their employment remains extremely seasonal. If farming becomes more mechanized, Harijan women are likely to lose their primary source of cash income--wage work in agriculture.

b) Irrigation has allowed the village to support an increased population by bringing more land under cultivation, providing more jobs for the landless, and increasing the desirability of the community. While families previously did not want to marry their daughters into Bagarpur because of its poverty and lack of amenities, they now do. Migration into Bagarpur is an important feature affecting current social organization. Most likely, many Harijan households and service caste households would not have moved into Bagarpur if irrigation had not arrived to provide new jobs. Whether those migrant households fare better in Bagarpur than they would have in their place of origin is unknown.

c) Irrigation has decreased the time required to do various nousehold tasks. Fuel and fodder procurement and water carrying are the most prominent examples. Both Jat/Siami and Harijans have benefited from labor savings in their respective households. Nevertheless, Harijan women have been hurt by labor-saving developments in the households of tneir potential domestic and agricultural employers.

d) Livestock raising continues to be an important economic and social feature of the village. The change from extensive to intensive livestock raising has affected women's labor since women play a central role in livestock management. This is one area where training and extension work can reach women and is not competitive with agricultural work.

e) Despite the increase in cash and greater contact with urban centers, village women remain relatively isolated from economic activities and decision making. The custom of purdah and the cultural features surrounding it play a significant role in determining the subtle and indirect changes in women's socioeconomic spnere.

Women in Bagarpur have never played a public role in political or managerial decisions. Irrigation's arrival has meshed well with the cultural system and brought about few contradictory changes. Nevertheless, it does appear to have increased tne gap between the opportunities available to landless and landed women. The scenario of Bagarpur may caution against assuming that irrigation benefits reach all women equally. Rather, its effects are felt very differently by different segments of the female population.

NOTES

1. This research was carried out under contract Purchase Order No. IN-P-1-074, US/AID, New Delhi, India. Dr. John Westley of the AID Mission in Delhi provided much appreciated comments and suggestions. The author would especially like to thank David Groenfeldt for his support and guidance both during the fieldwork and during the data analysis and writing. All tabulated data included in this paper are derived from census and questionnaires conducted by David Groenfeldt and the author during 1981.
2. The term "Harijan" refers to all Untouchable castes in the Indian caste hierarchy. Under Indian law, Harijans are classified as being particularly disadvantaged and hence eligible for certain benefits. They are also referred to as "scheduled caste."
3. See Groenfeldt (1981) for a detailed account of the impact of irrigation on farming strategies in the village.

Table 1. Bagarpur Village Caste Composition, 1981

Caste	Number of Households	Mean Size	Traditional Occupation
UPPER		7.4	
Jat	66		farmer
Siami	6		farmer
MIDDLE (Service)		6.6	
Brahmin	1		priest
Sonar	1		goldsmith
Lohar	1		blacksmith
Khati	5		carpenter
Nai	1		barber
LOWER (Harijan)		7.3	
Cnamar	4		leather worker
Dhanak	14		weaver
Cnuerda	1		sweeper

SOURCE: Field interviews, 1981.

NOTE: Not all households follow their traditional caste occupations. The goldsmith and three carpenters are agriculturalists who own their own land. The data, nevertheless, give a general picture of the types of jobs performed in the village. One Dhanak household left the village for seasonal wage work during the time of census and is not included in the tabulation.

Table 2. Average Land Holdings by Caste  
Bagarpur Village, India 1981

CASTE	ACRES
<u>Upper</u>	
Jat	20.86
Siami	9.67
<u>Middle</u>	
Service	6.04
<u>Lower (Harijan)</u>	
Chamar	4.63*
Dhanak	.63
Cheurda	---

\*One Chamar nousehold claimed to own 24 acres, but this acreage has not been included since the land was mortgaged and the family was unable to farm it.

Table 3. Population of Bagapur by Household Type and Period

Family Type	<u>1945</u>		<u>1951</u>		<u>1961</u>		<u>1971</u>		<u>1981</u>	
	No.	%								
Joint/Stem										
Married brothers and parents	3	11	6	16	8	17	12	16	21	21
Married brothers and bachelors	1	4	1	3	1	2	4	5	6	6
Married brotner	4	15	4	11	7	14	3	4	1	1
Parents and one married son	10	37	6	16	12	25	13	17	19	19
Total Joint/Stem	18	67	17	46	28	58	32	42	47	47
Nuclear										
Complete	9	33	19	51	19	40	41	55	51	51
Broken/No adult male	--	0	1	3	1	2	2	3	2	2
Total Nuclear	9	33	20	54	20	42	43	58	53	53
GRAND TOTAL	27	100	37	100	48	100	75	100	100	100

SOURCE: Field Interviews, 1981.

Table 4. In-Migrants by Period, Caste and Occupation  
Bagarpur Village

Period	Caste	# Households At Entry	Occupation
1940-45	Jat	2	Farmer
1946-53	Siami	4	Farmer
	Jat	1	Farmer
	Chamar Dhanak	1 6	Wage Labor Wage Labor
1954-60	Jat	1	Farmer
	Nai	1	Barber
1961-70	Jat	3	Farmer
	Sonar	1	Farmer/goldsmith
	Brahmin	1	Priest/wage labor
	Khati	1	Carpenter
	Cneurda	1	Sweeper/leather
	Chamar	2	Wage labor
1971-79*	Jat	2	Wage labor
	Lohar	1	Blacksmith
TOTAL		28	

\*last year of in-migration.

Table 5. School Enrollment by Caste and Sex,  
Bagarpur Village Primary School, 1980-81

Class	Caste		Caste		Total	
	Harijan male/female		Jat male/female		male/female	
5th	0	1	4	0	5	1
4th	0	0	3	1	4	1
3rd	1	3	14	1	19	5
2nd	0	0	9	4	11	4
1st	2	0	10	3	12	3
TOTAL	3	4	40	9	51	14

Table 6. Female Participation in Agricultural Wage Work, Rabi Harvest  
Bagarpur Village, 1981  
Data From 7 Sample Households

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No. of Person days from within Bagapur	No. of Woman days from within Bagapur	No. of Person days from outside Bagapur	No. of Woman days from outside Bagapur
155	47	128	21

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SOURCE: Field Interviews, 1981

NOTE: Data are for seven sample nouseholds only.

Table 7. Labor Participation During Rabi Harvest by Caste and Family Type, Bagapur Village, 1981

Caste	Family Type	
	Joint/Stem	Nuclear
Jat/Siami (unpaid agricultural labor)	71% (n=39)	55% (n=20)
Harijan (wage labor)	100% (n=7)	100% (n=2)

SOURCE: Field interviews, 1981.

NOTE: Data are for 40% sample nouseholds only.

Table 8. Livestock Ownership by Caste  
Bagarpur Village, 1981

Caste	TYPE OF LIVESTOCK				
	Buffalo	Cows	Camels	Goats	Sheep
Jat/Siami (N=26)	1.58	1.65	1.15	.41	.07
Harijan (N=9)	0.14	0.80	0.10	2.44	0.10
All nouseholds (N=35)	1.08	1.05	.75	.80	.08

SOURCE: Field Interviews, 1981

NOTE: Data are for 40% sample households only. Figures reflect mean number per housenold.

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