PN-AAW-172-
ISN-47749

15 The role of women in household production systems and rice farming in Nepal

Bina Pradhan

Introduction

The rural economy of Nepal is predominaatly agricultural with its production at a subsistence level. Rice farming is one of the main components of the agricultural system. In many parts of the country rice is the main staple food and also represents a status symbol for many poor rural households. Kathmandu Valley,[1] is one of the rice growing areas which have the highest yields in Nepal. Its yield per hectare is comparable to that of Japan and China during the 1950s and early 1960s.[2]

Women have a crucial role in the rice farming system in Nepal through their performance at various stages of rice production and agricultural management and in the decisions they make. Of course, women perform all of these roles as a natural process in the family farm and their contributions are not perceived by themselves or the men as a particular feature of the household economy or of the national economy. But because their activities and functions are confined to the non-monatised household sector their contributions remain invisible, and the development planners, policy makers and programmers fail to see the link between women's problems and larger problems of develop-

ment which are the problems of unemployment, hunger and poverty.

The women's role in rice farming has to be viewed as a part of their contribution in total household production, as rice production is only a part of the total production system in the family farm and the kind of activities that women perform in rice production are very closely bound up with their role in the family farm and household production system.

This paper is largely an extraction of some of the findings of CEDA (Centre for Economic Development and Administration, Tribhuvan University) status of women field studies as they related to women's role in rice farming in the context of the household production system. The presentation will be made in four sections. Firstly, a brief presentation of the household production system will be made, giving time allocation patterns and decision making processes. The next section will examine the role of women in the agricultural and rice farming system. In the third section an attempt will be made to show the effects of technological inputs on women. The fourth section will deal with women's accessibility to inputs and institutional credits for improvement of the farming system. Finally, some policy and programme implications will be set out/discussed.

The household production system

From the eight village field studies undertaken under the CEDA/status of women in Nepal project[3] it appears very clearly that the rural economy is a subsistence agricultural economy. It was found that in the sample households of all the eight villages 71 per cent to 91 per cent of the household income was derived from agriculture. Of household production 73 per cent to 96 per cent was consumed within the family that produced it. In other words, in all the eight communities the household is an important unit of production and consumption where goods and services for the household are produced within it and consumed by it. Only a very small proportion of household production (3.5 per cent to 27 per cent) goes into market sale. Agriculture is the dominant source of such household production.

Of total household income, taking an average for all the eight communities, only 18.6 per cent came from the market sector.

Taking these facts into account a conceptual model of the village economy was developed viewing it as operating in three sectors: the family farm enterprise, the local market economy sector and migration for employment. Each of these sectors offers a set of possible strategies for increasing the household income and subsistence level of the family. Most households combine various strategies within these three spheres

of activities in order to maximize their family welfare. These three sectors will now be examined in more detail.

Sector I: The family farm enterprise

This is central to the household production system and is where the rural household operates as a fundamental unit of production and consumption. The family farm sector includes all these activities which are outside the market economy, such as the conventional 'economic activity'[4] which includes agriculture and animal husbandry and the 'extended economic activity'[5] called elsewhere 'new home economic activity', which includes fuel collection, water collection, hunting and gathering, home construction and food processing. In addition to these 'economic' and 'extended economic' activities are the domestic activities[6] which provide the essential services to the family within the household. It is this sector with which we are primarily concerned in this discussion.

Sector II: The local market economy

Market economy activities are mainly those that are enacted in the market outside the family farm. These activities include outside income earning activities, such as wage labor in either cash or kind, trade and manufacturing. In this sector males predominate and female contributions are limited. However, only about 20 per cent of household income is generated from this sector although development efforts tend to concentrate in this sector.

Sector III: Migration for employment

This is short term migration for employment in the wider market economy beyond the village. Any paid employment as agricultural labor, domestic labor, in road work, construction, army service, trading etc. that required a household member to spend a night outside was included in this sector.

Each of the members of the household participate in all these spheres of activities to varying degrees thereby maximizing their household income and family welfare.

Relative participation of women and men in the three sectors of the economy

Figure 15.1 shows that women in each of the eight communities participate to varying degrees in each of the three sectors of the

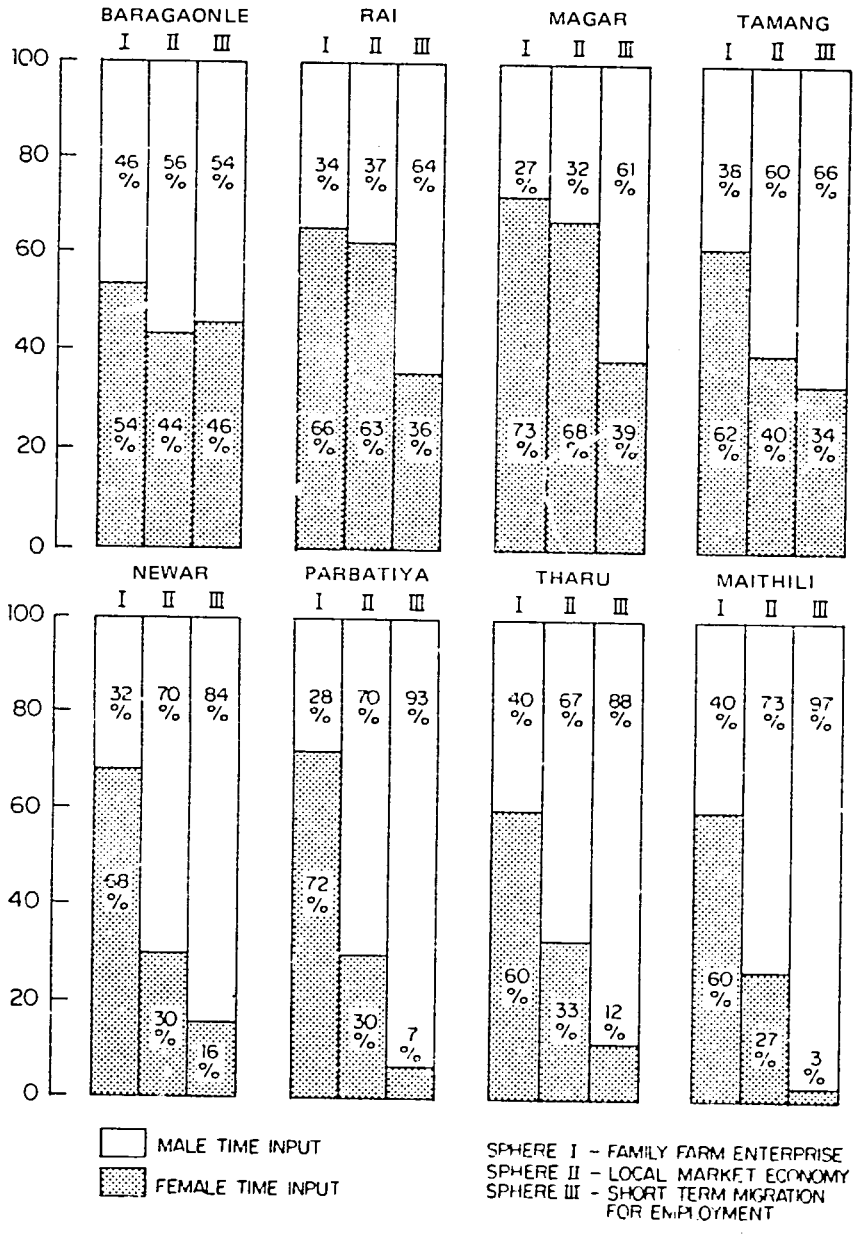

Figure 15.1: Male and female labor input in 3 sectors of the economy by village.

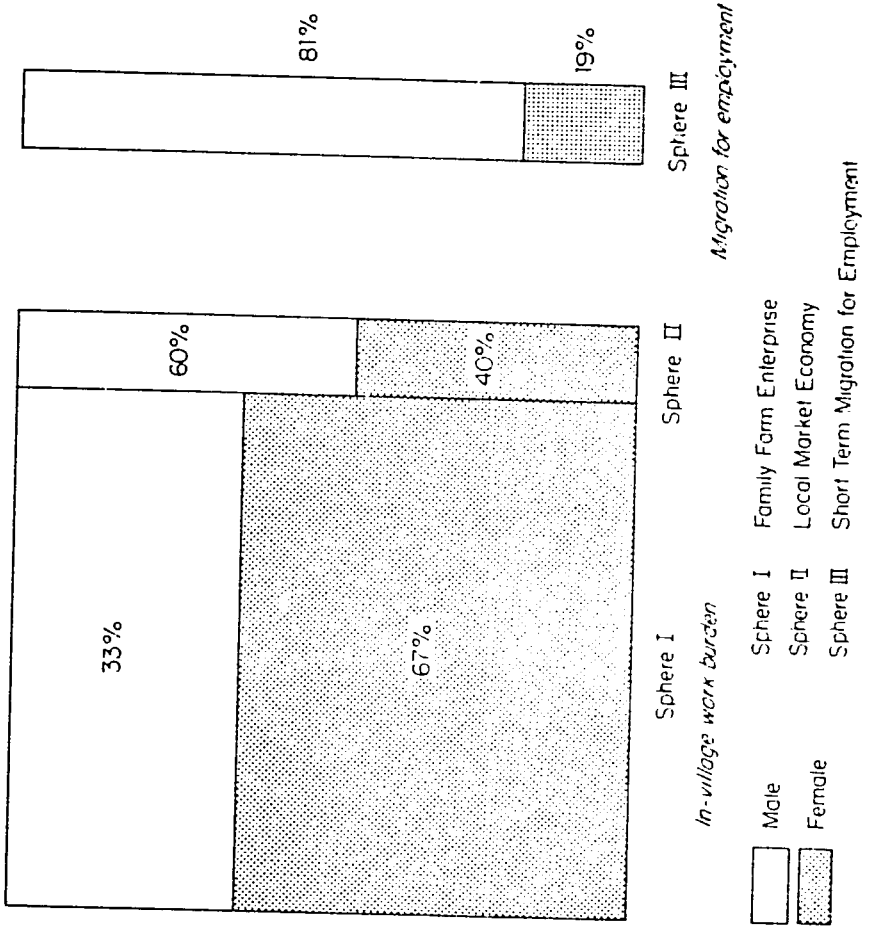

Figure 15.2: Relative participation of men and women in the three spheres of village economy.

economy. The consistent pattern that emerges is that in all communities women's participation is highest in the Sector I, family farm, activities. Their participation drops in Sector II activities and is still less in Sector III activities. The aggregate data reveal that 67 per cent of the time devoted to Sector I was put in by the women while in Sectors II and III it dropped to 40 per cent and 19 per cent respectively (Figure 15.2). Compared with women's participation, men's is much higher in Sector II and III activities. The aggregate data show that the average man spends 1.43 hours a day on animal husbandry and 2.73 hours a day on agriculture. However, the men are more likely to combine their work in the family farm enterprise with work in the market economy – either within the village on a daily basis or beyond the village on a seasonal basis. They can do both of these because of their socialization, greater mobility, greater access to education and better opportunities.

This pattern of women's activities being concentrated in the family farm sector with relatively less participation in the market sector and in migration to the outer sector of the economy was also found consistently true in many other countries of the developing world, countries in Asia, Africa, Latin America and the Middle East (Pradhan, 1983).

Variables affecting the participation of women

Although the aggregate data clearly show that women concentrated on the inside in household farm production, examination of the data for each village separately reveals significant differences in the degree to which women spend their time in the market economy in addition to their work in the family farm (Figure 15.1). One of the factors which comes out very clearly and which is discussed in the Aggregate Analysis (Acharya and Bennett; 1981) is the dichotomous nature of the community. The more pronounced the inside-outside or private/public dichotomy between the socially accorded domains of the sexes, (i.e. exclusion of women from the public spheres of politics and commerce because of their role in child rearing and domestic work), the less is the participation of women in the market economy, the public sphere of activities. The less pronounced the dichotomy between the sexes in the community the greater is women's participation in the market sector.

The mostly highly dichotomized communities among the villages studied were also the most conservative Hindu societies, i.e. the Maithali community in the Terai and the Parbatiya community (Brahman, Chetri and Sarki) in the Hills. In these communities women's participation in the local market accounted for only 25 per cent and 30

per cent respectively (Figure 15.1). In Sector III, employment outside the villages, the rate of women's participation is 3 per cent for Maithali and 7 per cent for the Parbatiya (Acharya, 1981: 152; Bennett, 1981: 160). The less dichotomized communities were also least influenced by orthodox Hindu values, i.e. the Kham Magar, Baragaonle and Lohorung Rai communities. In these communities women were found to be highly entrepreneurial, often earning cash income by brewing and selling beer, running hotels, trading, selling clothes or carpets produced at home. In these communities women contributed between 40 and 69 per cent of their time input in the local market and between 34 and 46 per cent of the person-days spent on employment outside the village. The other communities, the Newar, the Tharu and the Tamangs fall between the two extremes. The degree of participation of the women in these three communities in the market economy was 30, 40 and 33 per cent respectively. The percentage of time spent on employment outside the village was 16 per cent for the Newars, 34 per cent for the Tamangs and 12 per cent for the Tharus.

An equally significant factor which explains the different degrees of participation of women in the family farm, Sector I, and market economy, Sector II, is the subsistence level provided by the agriculture in each community. The more self-sufficient the subsistence agricultural production was to support the family the less need was there to seek outside income earning opportunities, and vice versa. The relatively non-dichotomous communities, Baragaonle of Kagbeni, the Kham Magar of Thabang and Lohorung Rai of Pangma, are also the communities who live in the high hills with poor agricultural conditions and their production is inadequate to sustain families. For instance, in Baragaonle and Kagbeni the climate is semi-arid. Barley, buck wheat and wheat, which are the main crops, can be grown only on irrigated land. Water is a limiting factor and thus prevents families from clearing new land for agriculture. Owing to high altitude and severe cold, the growing season is short and the crop yield is low. Intensive cultivation is practised only for a few months. Therefore, the long winter slack season forces many Baragaonle people to trade or seek outside employment. It is said that even those who stay in the villages remain idle which is a drain on their households' food reserves (Schuler, 1981: 8, 9). Similarly, all the land in the Magar area is *pakha*, or non-irrigated terrace land. Rice cannot be grown because of lack of water. The main crops are corn, barley and wheat. Potatoes are also grown and are intercropped in the corn or planted in marginal lands at higher altitude. The lack of water and deteriorating environmental conditions have limited agricultural expansion. It is reported that the village is poor by pan-Nepal standards, 'about a quarter could produce more than enough

food for subsistence needs, a third barely subsistence and the rest, a little under half, have less than enough land to meet subsistence needs' (Molnar, 1981: 27, 29).

On the other hand the more dichotomous communities such as the Brahmin Chetri of Bankundol and the Newars of Bulu, have richer soil and better availability of water than those in the high hill areas. Similarly in Sirsia, inhabited by the Maithali community, and in Sukrawar, inhabited by the Tharus, the land is relatively richer than the high hills. In all of these communities rice is one of the main crops.

There seem to be, then, two important factors which determine women's greater or lesser participation in the market sector: the dichotomous nature of the society and the agricultural capacity of the environment to produce adequate subsistence for the family. These two variables may be in line, as amongst the Maithali who have a highly dichotomised society and productive land and where the women consequently participate minimally in the market sector, and amongst the Baragaonles who do not have a very dichotomized society and who have a poor agricultural environment and where the women participate greatly in the market economy, or they may conflict. In some of the most conservative and dichotomous societies of Asia, where female movement and female sexuality is strictly controlled by society, women from certain sections of the community do participate in the market economy. For instance, in Bangladesh, where strict female modesty is maintained under *purdah* according to the Muslim religion, women from poorer households (with less than 2 ha. of land) participate to a greater degree in the market sector (1.55 hrs) compared with those from richer households (owning more than 2 ha. of land) who spend only .13 hrs. per day in this sector (Cain et al., 1979; table 2).

It was also found that there is a close relationship between female input of time in family farm activities, the extent of her participation in the market economy sector (employment beyond the village), and her input into decision making on the family farm. Greater decision making responsibility by women is associated with their greater level of labor input into domestic work and agricultural production as well as their participation in the outside economy. It was also found that women's decision making input in a given community is related to the strength of the inside/outside dichotomy in that community. Women in highly dichotomons communities of Maithali and Parbatiya had less decision making responsibility than those non-dichotomous communities of Lohorung Rai, Baragaonle and Kham Magar. The women of the Newar, Tamang and Tharu communities were closely confined to the 'inside', and they had more control over decisions in the domestic domain. In these communities men dominated the decision making process for major capital transactions and even for minor household expenditures.

Women exercised a great deal of control and influence in the decision making in those activities or areas for which they were responsible.

Participation of women in the family farm enterprise: rice farming and their role in agricultural decision making

It has already been shown that women are responsible for the majority of the work within the family farm enterprise (67 per cent). Figure 15.3 gives a detailed breakdown of the male/female work patterns in this sector. Figure 15.3 is an aggregation of the time input, of the eight villages, into various activities. It has already been mentioned above that there is a considerable variation in the male/female work patterns in different communities but the aggregation of data shows that men's input of labor time is more in animal husbandry than women's input, whereas in agriculture women's input of labor time is higher than male input indicating the important role of women in agriculture. In overall farm production women contribute 52 per cent as compared to 48 per cent by men.

In 'expanded economic' activities women's contribution is significantly higher than that of men except in hunting and gathering and home construction. In food processing, which includes threshing, drying, seed selection, storage, grinding, cleaning and winnowing, women do 87 per cent of the work. The value added for grain processing alone in the eight villages is Rs. 146,577 which is nearly 8 per cent of total household income. If the whole range of food processing, including liquor making and the preparation of dairy products etc. is considered, the value added amounts to Rs.279,568 or 15 per cent of the total household income out of which 8.473 per cent is contributed by women (Table 15.1). To understand the role and contribution of women in rice farming it has to be taken as a system including the whole production process, right up to the finished product for consumption or outlet in the market.

Only five of the eight village communities studied grow rice: the Brahmin Chetris, Newars and Tamangs in the hills agriculture and Maithali and Tharus in the Terai agriculture. Among them the *Jyapu* (Newar) technology is the most well known. It is highly labor and land intensive: within the limitations of traditional practices the yield per unit of land has reached a maximum (as shown in the introduction to this paper).

In all these communities rice is cultivated in the *pakha* land, low land which is wet and fertile. Such low land usually has irrigation and certainty of flooding during the monsoons and hence is appropriate for

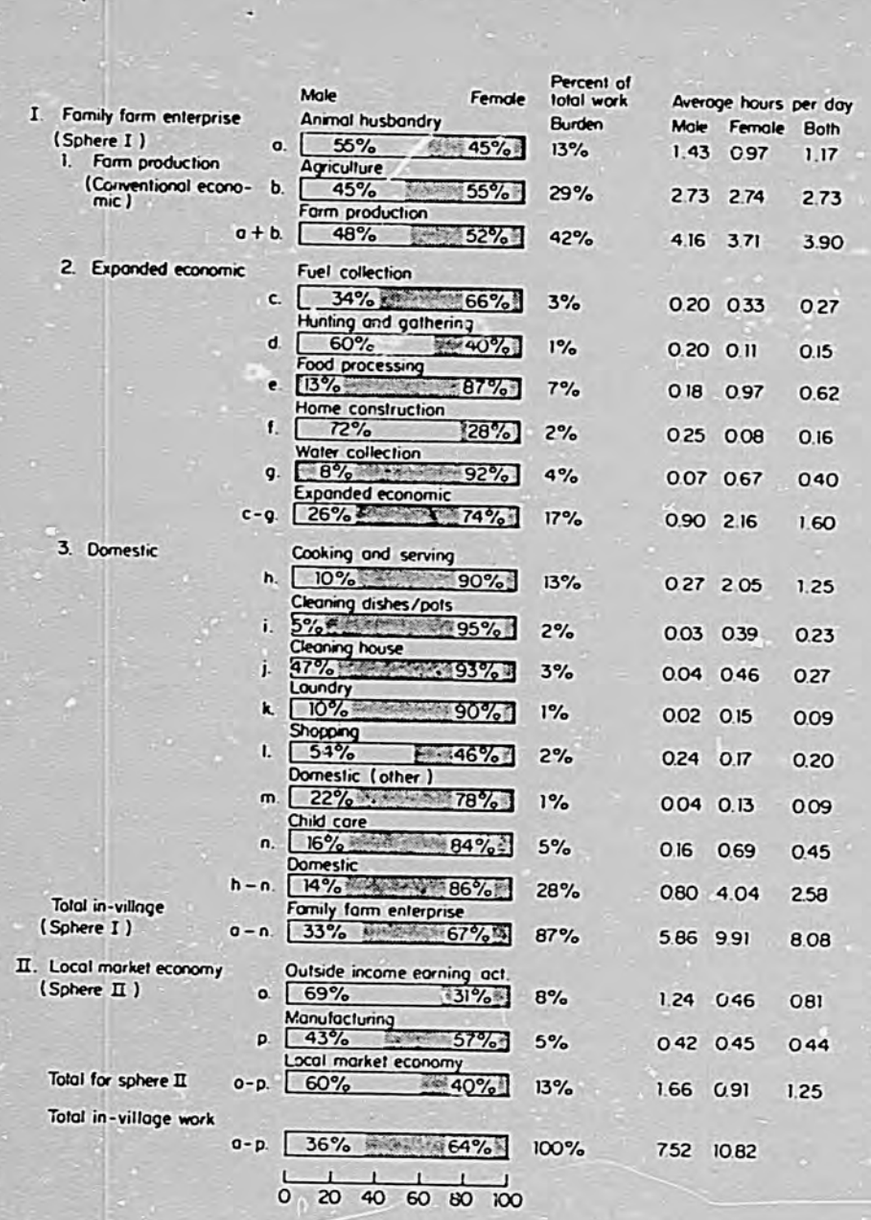

Figure 15.3: Distribution of male/female in-village work burden by activity.

Table 15.1 Male/female contribution towards household income.*

(In percent)

Sources of Income	Sex and Age Group: Male (15+)	Female (15+)	Male Child (10–14)	Female Child (10–14)	Total
Animal husbandry	46.95 (69119)	34.01 (50069)	8.45 (12440)	10.59 (15590)	100.00 (147218)
Agriculture	45.79 (458271)	48.98 (490197)	1.86 (18615)	3.37 (22728)	100.00 (1000811)
Agriculture (Exclusive of Kitchen Gardening)	45.54 (343496)	49.20 (371102)	1.88 (14180)	3.38 (25495)	100.00 (754273)
Kitchen Gardening	76.24 (15999)	22.10 (4638)	0.55 (115)	1.11 (233)	100.00 (20985)
Hunting and Gathering (including fuel collection)	43.70 (40589)	48.76 (45289)	1.93 (1793)	5.61 (5211)	100.00 (92882)
Manufacturing	43.05 (15698)	54.57 (19899)	0.91 (332)	1.47 (536)	100.00 (36465)
Textile	9.09 (1744)	89.51 (17170)	–	1.40 (268)	100.00 (19182)
Rope/Basketry	51.27 (4439)	45.00 (3897)	1.77 (153)	1.96 (170)	100.00 (8659)
Tools and Utensils	55.94 (1209)	42.91 (927)	0.77 (17)	0.38 (8)	100.00 (2161)
Leather Work	97.51 (4159)	1.81 (77)	0.68 (29)	–	100.00 (4265)
Sewing	32.81 (577)	65.63 (1155)	0.78 (14)	0.78 (14)	100.00 (1760)
Others	45.04 (99)	50.45 (111)	–	4.51 (10)	100.00 (220)
Food Processing	10.75 (30054)	84.73 (236878)	0.91 (2544)	3.61 (10092)	100.00 (279568)
Husking/Drying	9.00 (9135)	86.05 (87336)	0.94 (954)	4.01 (4070)	100.00 (101495)
Roasting/Grinding	8.06 (3634)	86.39 (38946)	1.25 (564)	4.30 (1938)	100.00 (45082)
Liquor Making	11.16 (13246)	87.91 (104343)	–	0.93 (1104)	100.00 (118693)
Food Preservation	19.86 (877)	78.01 (3446)	1.42 (63)	0.71 (31)	100.00 (4417)
Dairy Products	36.36 (741)	54.55 (1111)	–	9.09 (185)	100.00 (2037)
Others	32.74 (2284)	63.72 (4445)	0.88 (61)	2.66 (186)	100.00 (6976)
I. Sub-Total for Household Production	39.42 (613731)	54.10 (842332)	2.29 (35724)	4.19 (65157)	100.00 (1556944)
II. Wage and Salary	78.04 (164171)	20.13 (42337)	0.68 (1430)	1.15 (2525)	100.00 (210350)
III. Trading	60.33 (58720)	39.67 (38283)	–	–	100.00 (96503)
IV. Total Household Income (I+II+III)	44.86 (836122)	549.52 (922952)	1.99 (37154)	3.63 (67571)	100.00 (1863799)

Figures in parentheses indicate contribution in value terms (Rs.).
* Based on the 192 sample households included in the Time Allocation Study.

the cultivation of rice. On such land farmers mostly raise at least two main crops and two subsidiary ones.

The method of cultivation is purely manual and labor intensive using very few implements. In the Mathmandu Valley the only agricultural implements used are hoes for turning the earth, a wooden mallet fixed to a long shaft for breaking up the clods of earth, and an iron weeding sickle for weeding and cutting grass.

Bullocks are usually not used for plowing in hill farming particularly in the Kathmandu Valley since it is believed that plowing by hoe penetrates the soil deeper than does the plow drawn by bullocks. This mode, though very laborious, is said to be fully as productive to the farmer as that of plowing with animals. In the Terai areas plowing is done by bullocks and cultivation is more extensive as compared to the hill areas.

Once the plowing is completed by men, women of various ages break up the clods. The cultivation of paddy involves the maximum efforts of the villagers as it is done meticulously with a larger input of labor than for other crops. June to August/September is the busiest period for the villagers when many households experience a shortage of labor and wage rates are at their highest. To overcome this the villagers have evolved their own indigenous labor supply system which will be discussed later.

The villagers take immense care of the young rice plants. The planting takes a few weeks, and after that weeding is done twice or three times during the growth of the crop. They watch carefully until the roots are strong, and in the later stages, when the plants are heavy with grains, if there is strong wind or rain, the villagers tie the plants in bundles so as to make them stand straight and not droop with the grains into the water.

After the paddy is harvested it is threshed in the traditional way by beating small bundles of paddy plants on a stone. The chaff is separated from the grains by winnowing with a large fan. Nowadays some of the farmers with larger holdings use threshing machines. The Newar community reported that these machines are not very much more efficient and labor saving than threshing by hand. But threshing by hand does not release paddy completely from the straw and hence requires double threshing whereas the advantage of the machine is that it threshes the paddy completely in one operation.

Use of fertilizer

Traditionally the villagers use mainly home made manure. Four of the eight communities, Baragaoule, Lehorung Rai, Kham Magar and Tamang, still do not use chemical fertilizers. The other four

communities, Parbatiya, Newar Maithali and Tharu, use a mixture of both traditional and chemical fertilizer. In these four communities where chemical fertilizer has been introduced women's input is concentrated in the application of manure while men do most of the chemical fertilizer application. There are only a small number of households in these four communities that report that fertilizer application is shared (see Table 15.2). In the Parbatiy village 37 per cent of the households reported fertilizer application as a joint task whilst among the Japu Newars, Tharu and Maithali villages the percentages dropped to 16.7, 7.5 and 6.3 respectively.

Labor systems

Although the main source of labor in the villages is the family there are other kinds of labor. For normal household and agricultural work the household members provide their own labor. But the large supply of labor required during agriculturally active seasons of rice planting and at other special times is met by exchange labor *parma*, (labor help from families or relatives), wage labor and contract labor.

Under exchange labor family labor is exchanged on a reciprocal basis. Each year, specially during the planting and harvesting time, every household mobilizes labor from other households in addition to their own family labor, and an agreement is made between several households to work in each household in turn on a reciprocal basis. If female labor is required the female of the household mobilizes females of other households to work for her in exchange of her labor for them at other times. If male labor is required men do the same. A day's female labor is not exchangeable for a day's male labor, so they seek their own sexes for exchange. Sometimes, when one male labor day cannot be repaid in male l[illegible] two female labor days are given in exchange because the wag[illegible] males is twice that of females. Some households hire labor b[illegible] the going wage rate.

The [illegible]her t[illegible] of labor is contract labor. Under this system certain kinds of operations in the field which need to be accomplished within a given period of the time are contracted to laborers for payment with money.

Division of labor in agriculture

Taking the two most intensive rice growing areas in the study, Bulu in Kathmandu Valley and Bakundol in Banepa (in close proximity to the Kathmandu Valley) the detailed breakdown of agricultural activity (Tables 15.3 and 15.4) show that women participate in all the agricultural activities, except in Bulu land preparation. The operations in

Table 15.2 Fertilizer application by sex and village.

(In numbers)

Village	Type of Fertilizer	Sex: Male	Female	Both	Total
BARAGAONLE	Traditional	2(2.8)	9(12.7)	60(84.5)	71(100.0)
	Chemical	–	–	–	–
	Mixture	–	–	–	–
	Total	2(2.8)	9(12.7)	60(84.5)	71(100.0)
LOHORUNG RAI	Traditional	11(4.7)	40(17.2)	182(78.1)	233(100.0)
	Chemical	–	1(100.0)	–	1(100.0)
	Mixture	–	1(100.0)	–	1(100.0)
	Total	11(4.7)	42(17.9)	182(77.4)	235(100.0)
KHAM MAGAR	Traditional	6(2.9)	2(1.0)	200(96.1)	208(100.0)
	Chemical	–	–	–	–
	Mixture	–	–	–	–
	Total	6(2.9)	2(1.0)	200(96.1)	208(100.0)
PARBATIYA	Traditional	1(2.9)	28(82.4)	5(14.7)	34(100.0)
	Chemical	12(63.2)	5(26.3)	2(10.5)	19(100.0)
	Mixture	15(11.3)	56(42.1)	62(46.6)	133(100.0)
	Total	28(15.1)	89(47.8)	69(37.1)	186(100.0)
JYAPU NEWAR	Traditional	4(21.0)	14(73.7)	1(5.3)	19(100.0)
	Chemical	1(12.5)	7(87.5)	–	8(100.0)
	Mixture	78(44.1)	66(37.3)	33(18.6)	177(100.0)
	Total	83(40.7)	87(42.6)	34(16.7)	204(100.0)
TAMANG	Traditional	13(9.4)	37(26.8)	88(63.8)	138(100.0)
	Chemical	–	–	–	–
	Mixture	–	–	6(100.0)	6(100.0)
	Total	13(9.0)	37(25.7)	94(65.3)	144(100.0)
THARU	Traditional	5(3.9)	112(87.5)	11(8.6)	128(100.0)
	Chemical	13(92.9)	1(7.1)	–	14(100.0)
	Mixture	3(75.0)	1(25.0)	–	4(100.0)
	Total	21(14.4)	114(78.1)	11(7.5)	146(100.0)
MAITHILI	Traditional	1(10.0)	9(90.0)		10(100.0)
	Chemical	39(83.0)	8(17.0)	–	47(100.0)
	Mixture	13(33.3)	20(51.3)	6(15.4)	39(100.0)
	Total	53(55.2)	37(38.5)	6(6.3)	96(100.0)
ALL VILLAGES	Traditional	43(5.1)	251(29.8)	547(65.0)	841(100.0)
	Chemical	65(73.0)	22(24.7)	2(2.3)	89(100.0)
	Mixture	109(30.3)	144(40.0)	107(29.7)	360(100.0)
	Total	217(16.8)	417(32.3)	656(50.9)	1290(100.0)

Figures in parentheses indicate row percentages.
Source: Acharya and Bennett, *The Rural Women of Nepal*, 1981.

Table 15.3 Detailed breakdown of agricultural activity by sex in Bulu (for adult population).

(In hours per day)

Activity	Sex: Male	Female	Both
Land Preparation	.05	–	.02
Terrace upkeep & repair	.41	.02	.21
Collection & preparation of organic manure	.09	.07	.08
Carrying & spreading of fertilizer	.10	.04	.07
Planting operation	.01	–	–
Weeding	.01	.02	.02
Irrigation	.10	.06	.08
Harvesting and post harvesting	.06	.12	.09
Threshing	.60	.33	.46
Horticulture	.01	.09	.05
Kitchen gardening	.01	.01	.01
Seed selection & storage	.02	.03	.02
Guarding/Protection of crops	.08	.04	.06
Other Agri. Activities	.24	.15	.20
Total for Agri.	1.77	.97	1.37
Total for In-village Activities	16.00	16.00	16.00

Source: Pradhan, *The Newar women of Bulu*, 1981.

which the women are mostly engaged are threshing, harvesting, horticulture, collection and preparation of organic manure, irrigation and miscellaneous agricultural activities (Figures 15.4 and 15.5). It is interesting to find that, although land preparation is generally considered a male task in Nepal, women actually spend more time at it than men in Bakundol. Preparation of land for wet rice planting is done mostly by men. Harvesting is mostly done by women. It was observed in Bulu that although men and women participated equally in harvesting of the main crops (rice, wheat and corn) subsidiary crops (oilseeds, potatoes and others) were mainly harvested by women and hence the higher input of women in this operation. Seed selection and storing is also mostly done by women although men help in this activity.

The collection and preparation of manure is performed by both men and women equally. However, it is interesting to note that in Bulu 71 per cent of the application of chemical fertilizer is carried out by men while the female input is only 29 per cent.

Table 15.4 Detailed breakdown of time allocation within the agricultural sector in Bakundol (For adult population by sex).

(In hours per day)

Operation	Sex Male	Female	Both
Land preparation	0.21	0.32	0.27
Terrace upkeep	0.59	0.36	0.47
Preparation and applying chemical fertilizer	0.07	0.01	0.04
Preparation and applying organic fertilizer	0.04	0.24	0.15
Planting	0.03	0.02	0.03
Weeding	0.14	0.72	0.44
Irrigation	0.19	0.29	0.24
Harvesting and post harvest operation	0.51	0.69	0.60
Horticulture/Kitchen gardening	0.01	0.01	0.01
Seed selection	0.03	0.06	0.05
Crop protection	0.01		0.01
Other	0.03		0.01
All Agricultural Activities	1.86	2.72	2.32

Source: Bennett, *The Parbatiya Women of Bakundol*, 1981.

The most time consuming agricultural tasks for women seem to be the harvesting and post harvesting operations which include threshing, drying, cleaning and storing the grain, and weeding. These two tasks absorb 67 per cent of women's labor input in Bulu and 60 per cent of Parbatiya women's.

Agricultural cycle of male/female work patterns

The time allocation data show seasonal variations in the activity patterns of men and women (Figures 15.6 and 15.7). These coincide with the rice planting, corn harvesting, rice harvesting and wheat sowing periods. In Bulu the two major peak periods are between June July to mid-August and October to end November. The first peak is associated with rice planting, oilseed planting and corn harvesting. The second peak is associated with rice harvesting and wheat planting. In Bakundol,[7] there also appear two similar major peak periods. The first is between May and August and is associated with wheat harvesting and threshing operations, then with rice planting. The second peak period falls from October to December which is associated with rice harvesting and then with field preparation and planting of the winter wheat crop.

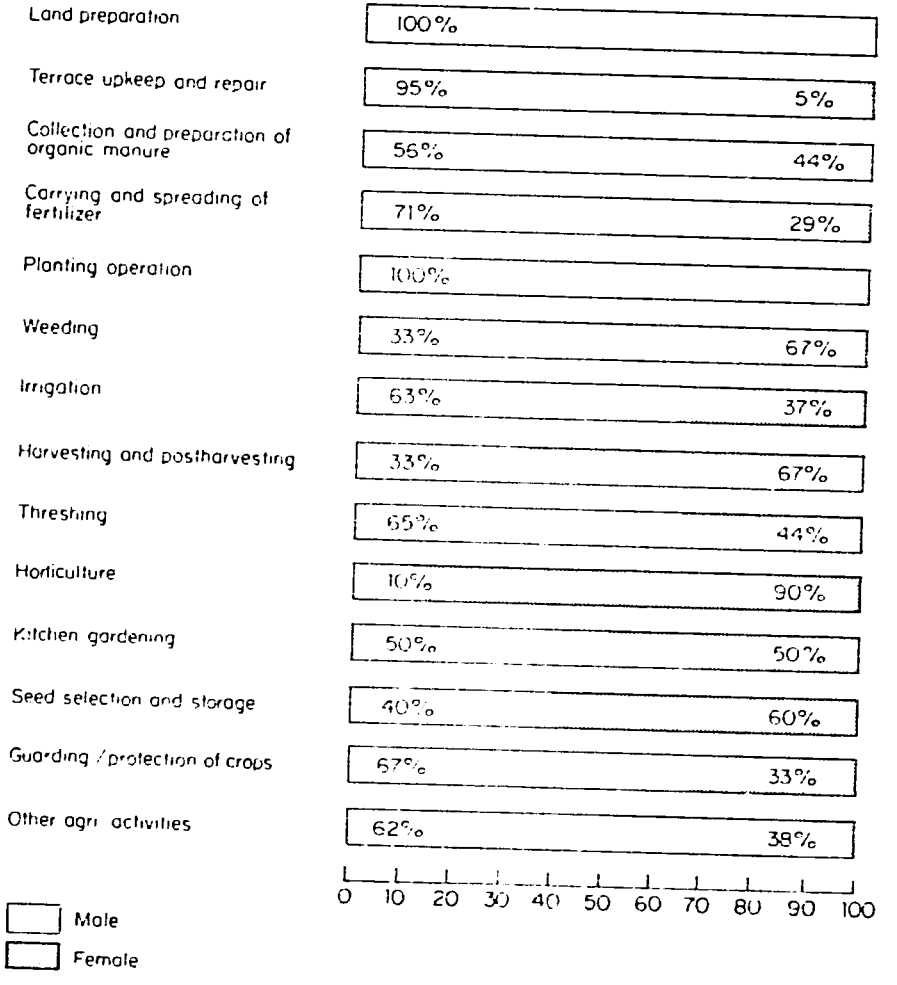

Figure 15.4: Male/female time input in various agricultural operations for unpaid family labor in Bulu.

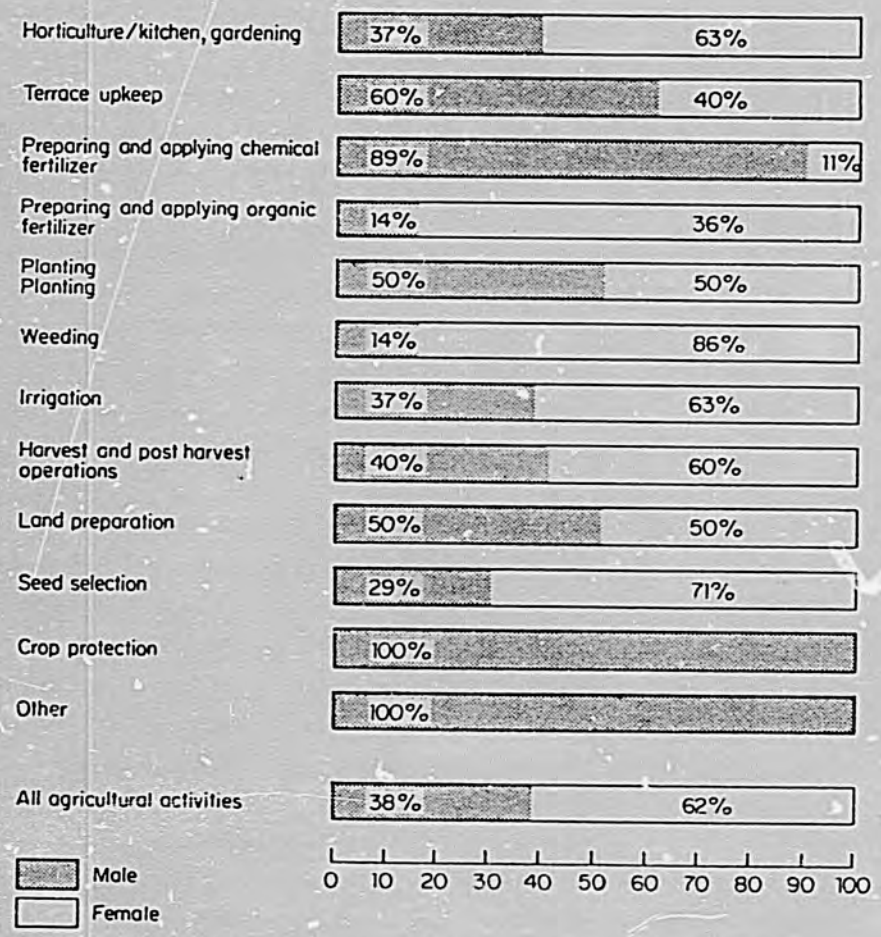

Figure 15.5: Male/female time input into various agricultural operations for unpaid labor in Bakundol.

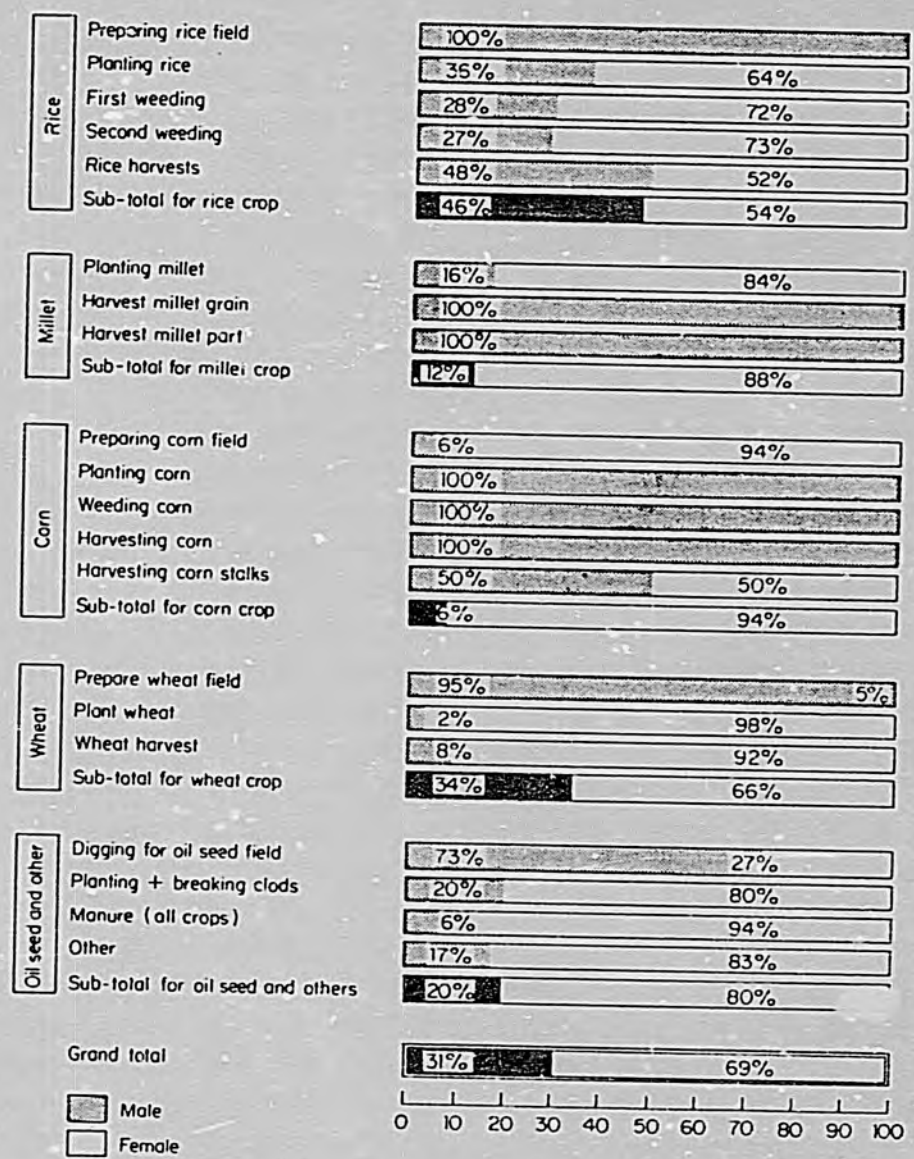

Figure 15.6: Male/female input into various agricultural operations in Bakundol for both unpaid family labor and wage labor.

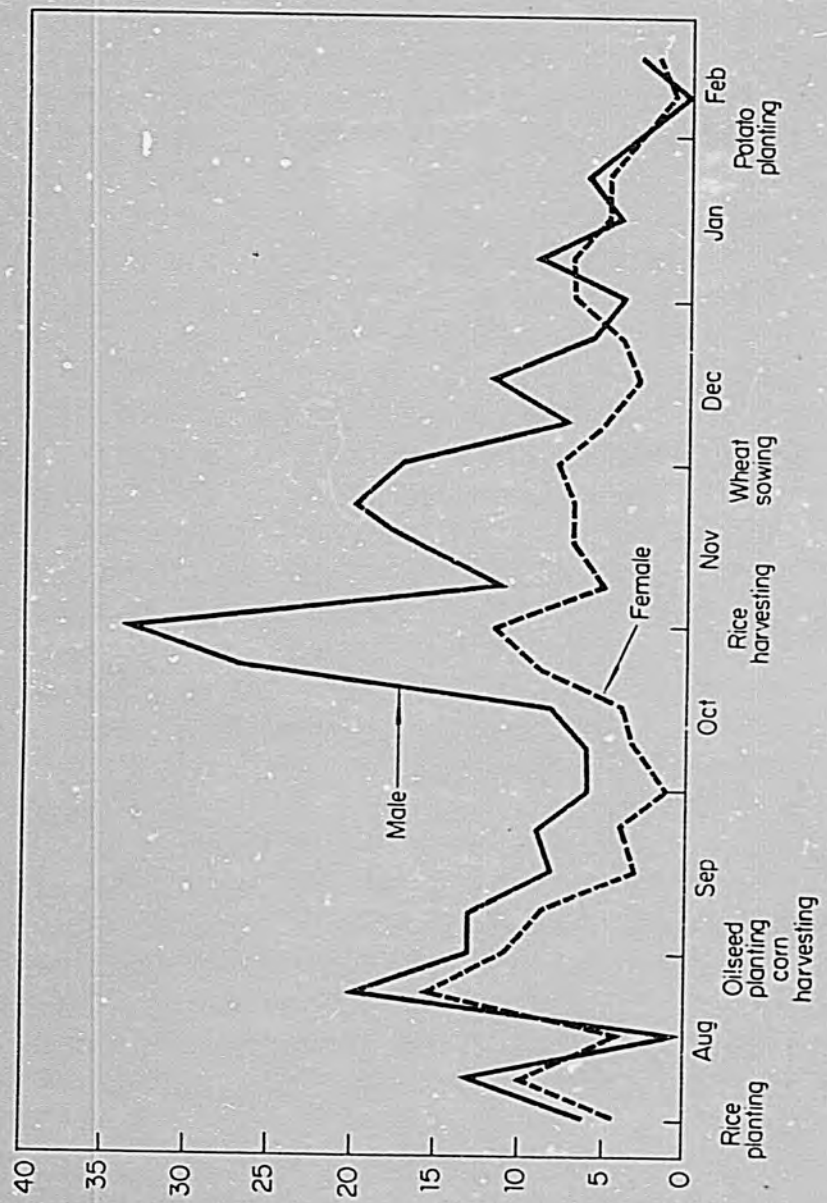

Figure 15.7: Weekly activity pattern—agriculture (for adult population in Bulu).

During these periods men and women have the highest agricultural work load.

Bakundol is the only village where data were documented for labor input into different crops and agricultural operations. Table 15.5 and Figure 15.8 are graphic representations of these data which show that only in the cultivation of rice does men's share of labor input approach that of women (46 per cent for male and 54 per cent for females). Men are responsible for one third of the labor input into the wheat crop and only 12 per cent for millet and 6 per cent for corn.

Although the data are shown only for Bakundol village, this pattern of work with the variations in the degree of labor input seems to be

Table 15.5 Labor input into different crops and agricultural operations by sex.

(In labor days)

Crop & Operation		Sex: Males	Females	Both Sexes
RICE CROP	Preparing rice field	413(100.0)	–	413(100.0)
	Planting rice	405(35.6)	733(64.4)	1138(100.0)
	First weeding	35(27.8)	91(72.2)	126(100.0)
	Second weeding	152(27.3)	404(72.7)	556(100.0)
	Rice harvests	320(48.0)	346(52.0)	666(100.0)
	Sub-total for rice crop	1325(45.7)	1574(54.3)	2899(100.0)
MILLET	Planting millet	112(16.0)	587(84.0)	699(100.0)
	Harvest millet grain	–	188(100.0)	188(100.0)
	Harvest millet plant	–	23(100.0)	23(100.0)
	Sub-total for millet crop	112(12.3)	798(87.7)	910(100.0)
CORN	Preparing corn field	33(6.3)	494(93.7)	527(100.0)
	Planting corn	–	205(100.0)	205(100.0)
	Weeding corn	–	154(100.0)	154(100.0)
	Harvesting corn	–	14(100.0)	14(100.0)
	Harvesting corn stalks	25(50.0)	25(50.0)	50(100.0)
	Sub-total for corn crop	58(6.1)	892(93.9)	950(100.0)
WHEAT	Prepare wheat field	394(94.9)	21(5.1)	415(100.0)
	Plant wheat	14(2.3)	589(97.7)	603(100.0)
	Wheat harvest	21(8.4)	228(91.6)	249(100.0)
	Sub-total for wheat	429(33.9)	838(66.1)	1267(100.0)
OILSEED & OTHER	Digging for oil seed field	63(73.3)	23(26.7)	86(100.0)
	Planting & breaking clods	16(19.8)	65(80.2)	81(100.0)
	Manure (all crops)	20(6.4)	293(93.6)	313(100.0)
	Other	5(16.7)	25(83.3)	30(100.0)
	Sub-total for oil seed and other.	104(20.4)	406(79.6)	510(100.0)
	Grand total	2028(31.0)	4508(69.0)	6536(100.0)

Figures in parenthesis indicate row percentages.
Source: Bennett, *The Parbatiya Women of Bakundol*, 1981.

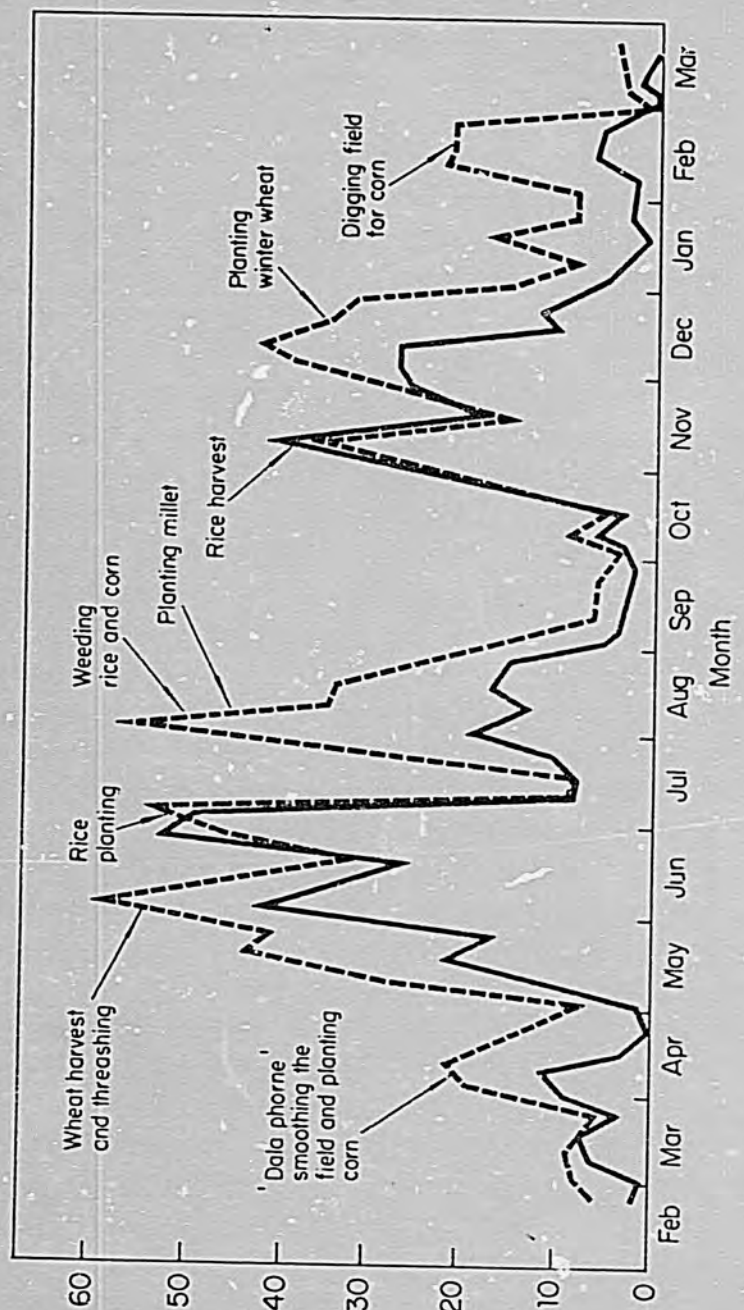

Figure 15.8: Weekly activity pattern—agriculture (for adult population in Bakundol).

true of the other rice growing areas as well: men's labor input is higher in the main crops while declining in the subsidiary crops.

Decision making role of women in agriculture

The data on decision making include overall decision making in agriculture. A breakdown of decision making for each crop is not possible. However, since rice farming is one of the main activities in the agricultural production system the data presented represent the decision making pattern for rice as well.

In most communities the women have an important role in agricultural decision making. In agriculture two types of farm management decisions are recognized: on labor allocation and on agricultural production. Table 15.6 presents the aggregate data on the male/female decision making responsibilities in the process of agricultural production. On labor allocation men take more decisions (46.2 per cent by males versus 39.4 per cent by females). In agricultural decisions women make an overwhelming majority of the decisions, particularly those concerning the use of their own or improved seeds (20.7 per cent by men and 60.4 per cent by women) and the seed selection process (81.2 per cent of the decisions are made by women). These decisions are crucial to the production yield in agriculture.

Table 15.6 Farm management decisions for 8 village sample.

Labor allocation

Type of Decision	Sex				
	Male	Female	Both	Traditional	Total
Arranges exchange labor	35.2	35.7	18.3	10.8	100.0
Arranges wage labor	42.4	29.3	15.7	12.6	100.0
Decides others work outside home	56.2	43.8	–	–	100.0
Decides own work outside home	51.7	48.3	–	–	100.0
All labor decisions	46.2	39.4	8.6	5.8	100.0
Agricultural decisions					
What crop to plant?	18.0	30.2	12.8	39.0	100.0
Own or improved seed?	20.7	60.4	10.9	8.0	100.0
Amount & kind of fertilizer	32.5	39.7	13.4	14.4	100.0
All agricultural decisions	25.3	42.1	12.6	20.0	100.0
Seed selection					
Who does seed selection?	10.8	81.2	8.0	–	100.0

Source: Table constructed from eight village studies.

There are considerable inter-community variations in agricultural decisions. The highest female input in farm management decisions was among the Lohorung Rai (72.7 per cent) and the lowest female

input (17.1 per cent) was among the Maithali community -- the only group among the villages studied where women actually had less say in farm management decisions than men. This is also the community of the eight where female labor time input is the lowest in agricultural activity as compared to men (23.4 per cent input by females and 76.5 per cent by males). The labor time input in agriculture of the Lohorung Rai women is the highest of the 8 communities (52.4 per cent of males and 47.6 per cent of females). As already discussed above, the degree of decision making responsibility not only coincides with the strength of the inside/outside dichotomy in a community but also directly coincides with the level of labor time input.

Impact of new technology on women

The Status of Women Project was not specifically concerned with assessing the impact of changing agricultural technologies on women and hence this kind of data was not collected. However, the inter-community comparison of sexual division of labor in the task of fertilizer application suggests an impact of agricultural inputs, such as chemical fertilizer, on women which will be discussed presently.

Other studies (Pudasaini, 1980, Karki, 1981; Malla, 1983 and others) relating to modernization in rice farming show that there has been only a limited introduction of modern technology in Nepal. Tractors and pumpsets represent the two most dominant forms of mechanization in Nepal, in addition to the introduction of new inputs such as chemical fertilizers and new variety seeds.

One study (Padasaini, 1980: 5–7) shows that the annual per hectare human labor absorbed by machine users was much higher than that absorbed by traditional farmers. Except for land preparation annual labor input increased for other operations such as dike repair and irrigation, transplanting/planting, fertilizing and spraying, weeding and harvesting and threshing. The maximum labor input increased for weeding and harvesting and threshing. According to the Status of Women Project findings these are the operations which are almost exclusively performed by women, particularly weeding. Although the differential impact on male/female is not given, it can be safely assumed that the increase in the labor requirement due to introduction of mechanization would be for female labor. This implicitly indicates additional heavy demands on female labor. The same study showed that for these operations family or exchange labor was mostly used.

Another study (Karki, 1981: 8–10) showed that the use of modern varieties of seed and fertilizer in paddy production resulted in a substantial increase in labor input (135 days vs. 107 days per hectare).

Most of this additional labor was required in preharvesting and harvesting operations while labor use in land preparation and crop establishment remained almost the same for both traditional and modern varieties. The reason given for this increase in family labor was that modern varieties required more careful and timely weeding spread out throughout the crop growing period. This also indicates an increase in female labor as this operation is mainly performed by women.

According to the findings of the Status of Women Project as already discussed above, men and women shared equally in the traditional use, preparation and application of manure. But in the application of chemical fertilizer men undertook the task rather than women (see Table 15.1). Most of the training on agricultural technologies and dissemination of information on new technologies have focused on men. This is an example of how the lack of participation of women outside the community and the lack of government action to consider social behaviour patterns in development planning has led to women being excluded from the dissemination of information on new technology in agriculture. If this is to continue women will soon be contributing less than they have done up to now which means of course, that the 'new technology' has had an adverse impact.

Such adverse effects of new technology in agriculture and rice farming have been amply documented in most of the developing countries. (Pradhan, 1983).

Women's access to institutional credits

Table 15.7 represents the use of credit by the villagers and their attitude towards taking such credit. This has important implications for

Table 15.7 Attitude/reasons for not taking institutional loans* (in number)

Reasons	Male	Female	Both
No need for loans	30(16.1)	68(24.1)	98(20.9)
Do not like to borrow	15(8.0)	37(13.1)	52(11.1)
Interest rate is too high	15(8.0)	12(4.3)	27(5.8)
Repayment schedule too strict	31(16.6)	32(11.3)	63(13.4)
Forms difficult to write	9(4.8)	23(8.2)	32(6.8)
Not treated with respect	3(1.6)	4(1.4)	7(1.5)
Do not know how to get credit	12(6.4)	27(13.1)	49(10.4)
No connection with institutions	6(3.2)	21(7.5)	27(5.8)
Others	66(35.3)	48(17.0)	114(24.3)
Total	187(100)	282(100)	469(100)

* The data are for the eight villages.

providing credit services for the support of agricultural development at the village level. In all 8 villages it was found that only 15 per cent of the females and 17 per cent of the males took institutional loans. Traditional money lenders and relatives and friends are still the major source of credit for the village. It shows clearly that more women than men lacked skills in dealing with credit institutions, faced bureaucratic difficulties of filling out forms, lacked connections with office personnel and lack knowledge of the procedures for getting loans.

Recommendations

The three sector model of the rural household economy is a sub-system of the national economic and social system and women's contributions can be perceived as a particular feature of the rural economy. Such a perspective provides a holistic view of women's intrafamilial and extra-familial roles as mother, family maintainer, subsistence farmer, petty traders and migrant labor. The framing of any strategies, policies or programs should be done from a systems perspective and holistic view of women. It is no longer adequate to deal only with women's specific problems and issues from the narrow perspective.

It has been rightly pointed out that institutions and bureaucratic systems limit women's access to technology, credit and extension programs. It is also pointed out in the body of this paper that the introduction of new technological inputs has had adverse effects on women because of the failure of governments to take into consideration the socio-economic realities of the rural household economy. Therefore, the transformation of rural life has to come from socio-political, economic and agricultural policies based on the dual strategies of institutional reforms and technological changes in the traditional rural economy. Institutional systems must be developed so that there is room to accommodate women and their multi-faceted roles in the rural households.

The training of female agricultural extension agents has been repeatedly suggested and it is re-emphasized here. In addition it is recommended that all extension agents, male and female, should be instructed and made aware that women farmers are equally important clients for their services. Those who supervise the extension agents should monitor the frequency and quality of contact with the rural women. Efforts should be made to ascertain the type of assistance needed by women. It has been shown that the responsibility for certain crops like rice, wheat, millet and corn is sex specific. The sexwise responsibility for particular crops, which may vary from region to

region, and sex-specific nature of various agricultural operations should be considered in targeting the agricultural agents' extension approach.

In Nepal women have little access to agricultural credit, the main reasons being that women do not have collateral or lack the bureaucratic knowhow to interact with formal credit institutions. However, there are programs like the Small Farmer Development Programme (SFDP) and the more recent Priority Sector Production Credit for Rural Women. There are Women's Group Organizers (WGOs) who function in each of the SFDP program areas and Women Development Officers (WDOs) are being trained to function and guide the rural women in the program areas. It is recommended that these WGOs and WDOs assist women not only in obtaining credits but also in gaining access to improved production technologies and inputs, making women aware of the existing facilities, encouraging them to use such facilities and teaching them the process/procedures in getting access to such facilities/services.

As women play a very crucial role in the production yields of the various crops by processing the crops as well as in the overall production process, it is recommended that training programs and projects should set aside a minimum percentage for female participation and that a certain percentage of the budget be allocated specifically for women. This should happen in project such as the following:

(a) training programs for farmer leaders and contact farmers to impart knowledge of technical skills and new agricultural equipments;
(b) distribution of agricultural inputs such as fertilizers, seeds and implements and agricultural credit;
(c) all Integrated Rural Development Projects (IRDP) which are operating (there are seven such projects operating in the country in different regions); and
(d) the Rural Save Grain Project (RSGP) which focuses on imparting training and information on post harvest food grain losses.

As it is evident that the new technologies tend to have adverse effects on women, it is essential that evaluations of the differential impacts of various technologies on men and women be made to provide a guide in introducing or transfering new technology to benefit women.

Notes

1 Kathmandu Valley is one of the main rice growing areas consisting of Kathmandu, the capital, Bhaktapur and Lalitpur districts, the

oldest cities in Nepal. Newars were the original inhabitants of the Valley and to-day they form the bulk of the population. Among the Newars the *Jyapus* are the farmer class who have highly developed agricultural practices within a traditional style and who made the valley one of the most fertile areas in the world.

2 Taking an average for 1955/56 to 1960/61 the paddy per hectare of arable land in Japan was 4.56 tons and 2.54 tons in China (Ishikawa, 1967:70) Around the 18th century the paddy yield in Kathmandu Valley had already reached 4 *muris* per ropani of land which is 3.9 tons per hectare (Hamilton, 1819: 225). In recent years, taking the average for 1970/71 to 1976/77, the paddy yield per hectare is 3.46 tons in Kathmandu Valley. (HMG, 1979: 44, 45).

3 The Status of Women in Nepal was a three year research endeavour of a team of eight members, including the author, carried out by the Centre for Economic Development and Administration (CEDA), Tribhuvan University, Kirtipur, Kathmandu under a grant from USAID. For a detailed discussion of the theoretical basis for the methodology employed see *Field Manual: Guidelines for Collection and Analysis of Data on Status of Women in Rural Nepalese Communities*, prepared by the Status of Women Team members, (CEDA, 1979). The series of eight monographs (two yet to be published) and an aggregate analysis based on the eight individual village studies comprise *Volume II Village Study Series.*

4 As reported by Acharya (1979:45) the census definition of 'economic activity' covers 'working in agriculture, trade, industry (weaving, oil pressing, sewing and manufacture of domestic utensils and weapons), and receiving cash or kind income in the form of wage, salary of profit 'as well as working in any of these activities as' unpaid family workers'; when this definition is applied to the 12 major activity categories used in the time allocation study, the 'conventional economic activity' or 'labor force participation' include animal husbandry, agriculture, manufacturing (i.e. weaving, basket making etc.) and outside income earning activities (i.e. wages and salary work, trade and business.

5 This category includes fuel collection, hunting and gathering, water collection, household construction and food processing. All these activities are performed commercially in the industrialized/urban sectors of the economy and particularly so in the west. As such these activities are categorized as economic and are included in the labor force participation, since it would be arbitrary not to include them as 'economic' in the rural household subsistence production just because the family labor is unpaid.

6 The domestic activities include cooking, cleaning, laundry, shopping, child care and other household chores. The production model used by scholars of 'New Home Economics' (Becker: 1965, Gronau: 1973 and Evenson, et al., 1979), as applied in the Philippines time allocation study, takes these services as economic and credits them in the household income which is the concept of full income. But in our study in Nepal 'domestic service' has not been valued in monetary terms because of the difficulty of assigning an alternative value and also because these services are unmeasurable and cannot be classified by a market value.

7 The time allocation in Bulu was observed for 6 months of the peak agricultural season whereas in Bakundol the observation was for a whole year.

References

Acharya, M., *The Maithali Women of Sirsia*, The Status of Women in Nepal, Vol. II part 1., CEDA, Tribhuvan University, Kathmandu, 1981.

Acharya, M., *Statistical Profile of Nepalese Women: A Critical Review*, The Status of Women in Nepal, Vol. I part 1. CEDA, Tribhuvan University, Kathmandu, 1979.

Acharya, M. and Bennett, L., *The Rural Women of Nepal: An Aggregate Analysis and Summary of 8 Village Studies*, The Status of Women in Nepal, Vol. II part 9. CEDA, Tribhuvan University, Kathmandu, 1981.

Becker, G.S., 'A Theory or the Allocation of Time' in *Economic Journal*, 75 (September 1965) 493–517, 1965.

Bennett, L., *The Parbatiya Women of Bakundol*, The Status of Women in Nepal, Vol. II part 7. CEDA, Tribhuvan University, Kathmandu, 1981.

Cain, M.M., Khanam, S.R., and Nahar, S., 'Class Patriarchy and Women's Work in Bangladesh' in *Population and Development Review*, Vol. 5, 1979.

Evenson, R.E., Popkin, H.H., and Quizon, E.K., *Nutrition, Work and Demographic Behaviour in Rural Philippines Household: A Synopsis of Several Laguna Household Studies*, Centre Discussion Paper No. 308, Eco. Growth Centre, Yale University, USA, 1979.

Field, Manual, *Guidelines for Collection and Analysis of Data on Status of Women in Rural Nepalese Communities*, CEDA, 1979.

Gronau, R., 'The Intra Family Allocation of Time: The Value of Housewives' Time' in *American Economic Review*, Volume 63, No. 4, 634–651, 1973.

Hamilton, F.B., *Account of the Kingdom of Nepal and the Territories Annexed to this Domination by the House of Gorkha*, Manjusri Press, New Delhi, 1819.
Hayami, Y., *A Century of Agricultural Growth in Japan*, University of Tokyo Press, 1975.
HMG, *Agricultural Statistics of Nepal*, Ministry of Food and Agricultural Marketing Services, Agricultural Statistics Division, Nepal, 1977.
Ishikawa, S., *Economic Development in Asian Perspective*, Tokyo, 1967.
Karki, B.B., *The Impact of Modern Varieties of Rice on Farm Income and Income Distribution in Eastern Nepal*, Research paper series, No. 12, A/D/C and APROSC, Nepal, 1981.
Malla, P.B., *Logit Analysis of Technology Adoption by Rice Farmers in Dhanusha District, Nepal*, Research paper series, No. 22, A/D/C, Agricultural Projects Services Centre (APROSC), Nepal, 1983.
Molnar, A., *The Kham Magar Women of Thabang*, The Status of Women in Nepal, Vol. II part 2, CEDA, Tribhuvan University, Kathmandu, 1981.
Pradhan, B., *The Newar Women of Bulu*, The Status of Women in Nepal, Vol. II part 6, CEDA, Tribhuvan University, Kathmandu, 1981.
Pradhan, B. and Bennett, L., *The Role of Women in Hill Farming Systems*, paper presented at the seminar on Appropriate Technology for Hill Farming Systems 22-26 June. The Dept. of Agriculture, HMG/Nepal, ADC/Nepal and Integrated Cereals Project, Kathmandu, 1981.
Pradhan, B., *Work Patterns of Women Related to Agricultural Production – Issues on Women in Development* (Draft) 1983.
Pudasaini, S.P., *Farm Mechanization, Employment and Income in Nepal*, Research paper series, No. 3, A/D/C and APROSC, Nepal, 1980.
Rajaure, D., *The Tharu Women of Sukrawas*, The Status of Women in Nepal, Vol. II, part 3, CEDA, Tribhuvan University, Kathmandu, 1981.
Schuler, S., *The Women of Baragaon*, The Status of Women in Nepal, Vol. II, part 5, CEDA, Tribhuvan University, Kathmandu, 1981.

16 Technological infusion and employment conditions of women in rice cultivation areas

Sarthi Acharya and Praveen Patkar

Introduction

Technological change and its impact on traditional under-developed societies which began modernization through external impulse rather than through an indigenous evolution, has been of intense discussion in the last two decades. This is particularly so in populous Asian countries where large numbers in the society were (perhaps) detached from the low productivity earning equilibrium of their stable occupations and were exposed to market imperatives. It is alleged by some that women in rural labor and small farmer households have been particular targets of the adverse impact – that they have been displaced from their traditional jobs in certain cases, while in others the 'double burden' on them has intensified. They have also lost the little control they earlier possessed on the household budget. A more detailed documentation on these aspects has been provided by Agarwal (1981).

The impact of technology, which includes a transfer of a whole matrix of socio-economic coefficients, has had a different impact on different segments of the rural economy. The peasant families consider it a matter of prestige to withdraw the female labor force from work in most areas as affluence increases, which adversely influences the social