

Kavita. (2014). Participation of Woman in Agriculture: A Study of Western Uttar Pradesh. *Journal of Studies in Dynamics and Change (JSDC)*, 1(3), 166-185.

Participation of Woman in Agriculture

A Study of Western Uttar Pradesh

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ABSTRACT

From the analysis of labour use in agriculture one observes a clear segregation in the agricultural activities by sex. Weeding, cleaning grain and storage of grain are done exclusively by women. Activities related to land preparation, irrigation, spraying fertilizer and pesticides are generally done by men. Other agricultural operations such as seed collection, dung spraying, sowing, transplanting, harvesting, threshing, and carrying the grains to home are jointly done by the men and woman. But all market related activities like buying agricultural inputs and hiring labour and sale of output are exclusively done by the male members, generally the head of the family. One can conclude from the above analysis that while women share a large burden of agricultural activities, they are assigned an inferior role. Tasks requiring use of machines, new inputs and market related activities are controlled by men. Women are mostly involved in lighter manual work and work not related to marketing activities.

Keywords: Labour use in agriculture, Women and work, gender based division of labour **JEL Classification**: J21, J61, R23

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The author is Assistant Professor in Giri Institute of Development Studies, Lucknow. She is thankful to Prof. A.K. Singh for his guidance in preparing this paper. The paper is based on the doctoral thesis of the author submitted to Chhatrapati Shahu Ji Maharaj University, Kanpur under the supervision of Prof. A.K. Singh, Director, Giri Institute of Development Studies, Lucknow

Introduction:

Work activities of women and men in a rural environment primarily revolve around land and related resources. In addition to these activities every households requires the performance of a minimum amount of housework for carrying on its day to day activities. The household constitutes a basic unit of production in all such societies where agricultural production depends almost entirely on use of family labour (Sethi, 1991, p. 44). In a peasant household, agricultural activity is considered most important because it fetches a direct monetary reward for the household. The activities associated with agriculture such as the management and care of livestock are considered of secondary importance since they contribute to additional income or consumption for the household but are not the chief source of livelihood. A third area of work is household work. an activity where the labour of the individuals is not paid for if it is performed for one's own family. Labour performed for one's own family is said to have use value rather than exchange value. It is quite

often seen that in patriarchal societies men are assigned those types of activities which have a direct exchange value and therefore the work of women is considered of little exchange value and is considered less important (Menon, 1982, p.30). In the sex based segmentation of labour some activities are generally restricted to men and others to women. Agricultural activity is often termed as a man's job and housework as a woman's job.

Rural woman are extensively involved in agricultural activities. The nature and extent of their involvement differs with the variations in agro-production systems. The mode of female participation in agricultural production varies with the land-owning status of farm household. Their roles range from managers to landless labourers (Vinod Kumar et al, 1985, p 277). Women are still largely concentrated in agriculture as self-employed or casual labour. workers face various Women forms of discrimination, including job-typing that pushes them in low paying jobs. (Nisha and Ravi 2009) An analysis of international statistics (ILO, FAO, NPC)



©LOKKATHA Debate on Development Website: <u>http://www.jsdc.lokkatha.com</u> was carried out by Dixon (1982), which showed that women constituted 38 per cent of the agricultural labour force in developing countries. For nineteen countries of South and South East Asia, Dixon (1982) estimated that 45.3 per cent of the agricultural labour force consists of women. Chauhan (2011) found in his study that Farmwomen's participation was seen highest in sowing, weeding and nipping / picking and threshing. These findings are in conformity of Chauhan and Thakor, (2006) and Chayal and Dhaka, (2010).

Socio-Economic Background of the Study Area

The two districts located in the north western part of Uttar Pradesh were selected for the study. With a population of 16.64 crores in 2001 Uttar Pradesh is the most populous state in the country accounting for 16.4 per cent of the country's population. It is also the fourth largest state in geographical area covering 9.0 per cent of the country's geographical area. About three fourth of the workers in the state are engaged in the agricultural sector. The state is well endowed in terms of good soil and plentiful water resources. It is a major producer of several agricultural crops in the country. Wheat, rice, sugar cane, pulses, oil seeds and potatoes are its main products. Sugarcane is an important cash crop. Uttar Pradesh is also an important producer of horticultural crops.

Land use Pattern

Land use pattern has important implications for the economic growth and environmental balance of any area. Land use pattern in the two districts is shown in Table 1. In Muzaffarnagar district more than 77 percent and in Baghpat district more than 80 percent area has been brought under cultivation, which is higher as compared to the proportion of net cultivated area at the state level (68.93 percent). Almost entire cultivated area is under irrigation in the two districts. Tube-wells are the main source of irrigation supplemented by canals. In fact most of the blocks in the two districts are classified as dark due to high withdrawal of ground water. Almost entire cultivated area is under irrigation in the two districts. Cropping intensity is 145 and 159 in Muzaffarnagar and Baghpat respectively. This is so because the two districts specialize in growing sugarcane which is a long duration crop. Average size of holding in both the districts is small-1.1 ha in Muzaffarnagar and 1 ha in Baghpat in 2000-01. The study area is known for its mixed farming pattern with animal husbandry as an important subsidiary industry. The scheduled castes also rear milch animal as their main livelihood activity. District Muzaffarnagar and Baghpat have sizeable number of livestock specially the milch animals (Table1).

Muzaffarnagar and Baghpat are among the richest districts of U.P. Per capita income of Baghpat was Rs. 24,009 in 2006-07 as compared to Rs. 20,468 in Muzaffarnagar and Rs. 14,685 in the state as a whole (Table 1). Thus both the districts have a much higher per capita income as compared to the state. Table 1 also shows the total and rural population of Muzaffarnagar and Baghpat districts. Muzaffarnagar had a population of 35.43 lakh in 2001, while Baghpat had a population of 11.64 lakh. The proportion of male population in both the districts is higher than that of females. The practice of female infanticide was also prevalent in the region. Uttar Pradesh had a literacy rate of 56.3% in 2001, which is lower by 8.5% points than that at the national level (64.8%). The literacy rate for males stands at 68.8% and for females at 42.2% in 2001 census. At the district level, district Baghpat has registered higher literacy ratio (64.2%) than district Muzaffarnagar (60.7%). The literacy scenario by sex indicates a very uneven pattern at district level. Data also shows that female literacy is lower than male literacy. Women work participation rate is very low in the study area Uttar Pradesh. Only about 15 percent of females are in work force (main + marginal) (Table 1).

Data and Methodology

The main objective of this study was to examine the Participation of women in different agricultural activities. The study will particularly focus on the western region of Uttar Pradesh. The region has been selected, as it is a prosperous agricultural region, which is referred to as the food and sugar basket of Uttar Pradesh. Hence we have selected two districts of the region for detailed study, namely, Muzaffarnagar and Baghpat. The former is predominantly sugarcane growing district and the latter a wheat growing district.

A multi-stage random sampling design has been used for the selection of the sample households. In the first stage two districts from Western region of U.P. have been selected purposely reflecting the cropping pattern in the region. In the second stage two blocks has been purposely selected from each district. In the third stage, two villages have been randomly selected from the selected blocks. In the final stage we selected 30 cultivating households randomly for field survey from each village representing the different size classes of land holdings, namely, marginal, small, medium and large cultivators. Thus, our total sample consists of two districts, four blocks, eight villages and 240 households.

The study is mainly based on primary data, which is collected from rural households through a field study in selected villages of western region of Uttar Pradesh. Information from the selected households was collected with the help of detailed survey schedule. The reference period for the study was agricultural year 2007-08.

In our field survey we have collected detailed information about time spent by different family members on agricultural activities, animal husbandry and household work. For purposes of analysis detailed information was obtained on these activities. Total hours spent on work have been converted into persondays by assuming that one persondays consists of eight hours of work.

Participation of Family Labour in Agriculture

Utilisation of family members in agriculture depends on the requirement for labour and varies from season to season and activity to activity. We first discuss the participation of family labour in agricultural activities by major crops and activities. Participation rate is measured as the proportion of family members participating in a particular activity. For adult members participation ratio is calculated with reference to members above 15 years and for boys and girls with reference to children between 5 to 15 year age group.

Work Participation by Size of Farm

Table 2 shows work participation in agriculture by sex and size of farm. Work participation ratio for all sample households comes to about 20 percent for female and 49.00 percent for male members. About 9 percent of boys and 2 percent of girls also work on family farm. FWPR are highest for marginal farmers (23.17%) and lowest for large farmers (15.84%). In case of MWPR highest participation is observed for medium farmers (53.73%) and lowest for marginal farmers (44.67%). Participation of boys and girls in agriculture is also relatively higher in marginal farmer households.

Work Participation in Sugarcane Cultivation

Table 3 shows the participation rate for family members in different activities in sugarcane

cultivation. Overall around 18 percent females and 61 percent males participate in sugarcane crop. If we see the activity-wise participation of woman, we find that female participation is high in some activities such as seed collection and cutting (41.20 percent), sowing (32.05 percent), weeding (44.02 percent) and *chilai* and *dhulai* (30 percent). Male participation is high in seed collection, sowing dung spraying, pesticide application, loading and irrigation. 3 to 7 percent girls also participate in dung spraying, seed collecting, sowing, weeding and *chilai* and *dhulai*. Boys participation is more in sowing, seed collection, *chilai* and loading.

Work Participation in Wheat Cultivation

Table 4 shows family labour participation in wheat crop. Threshing and harvesting of wheat have to be completed within a specified period of time when the crop ripens, so that new crops can be sown immediately afterwards. Family labour has, therefore, to be involved in these activities. Female labour participation in wheat (27.72) is higher as compared to sugarcane (17.76 percent). About 20-22 percent females participate in land preparation and dung spraying and around 30-35 percent in sowing and weeding of wheat crop. Irrigation, fertilizer and use of pesticide are mainly male dominated jobs. About 45 per cent of female family members are involved in harvesting, threshing and carrying of grain and chaff to home, while 72 percent are involved in cleaning and storage of grain. Male members generally do not participate in weeding, cleaning and storage of grain. In other activities their participation is high. About 64 percent of boys also participate in harvesting and threshing. Participation of girls is much lower, but they do help at the time of harvesting and in cleaning and storage of grains.

Work Participation in Other Crops

Table 5 shows the participation rate of family labour in cultivation of other crops. Participation rate of family labour both male and female is lower in other crops as compared to sugarcane and wheat. In these crops women participation is around 14 percent while male participation is around 35 percent. In sowing 20 percent females and 60 percent males participate. In weeding and harvesting females participation is 30-40 percent while male participation is 34-64 percent. One thing which is noteworthy is that around 11 percent female participates in sale of other crops unlike the sale of sugarcane and wheat. It is because mostly pulses are sold by woman to needy families within the village. Young children do not generally participate in cultivation of other crops.

Participation in All Agricultural Activities

Table 6 shows the family labour participation in agriculture by sex and activity. 21.8 percent of female family members participate in agriculture on average, whereas this proportion is 50.4 percent for male members. The participation rates for boys and girls are 10.6 and 2.5 percent respectively. Participation level, however, varies from activity to activity. Thus, female labour participation is 72.4 percent in case of storage of grains, 43.9 percent in harvesting, 43.2 percent in seed collection, 39 percent in loading and 37.7 percent in weeding. On the other hand their participation in irrigation, fertilizer and pesticide application, purchase of inputs, etc. is very nominal. Male labour participation also varies from activity to activity. In operations which are more labour intensive and have to be completed in short duration, higher number of family members participate. Boys participate in larger numbers in loading and threshing, while girls are mainly used for storage.

Time Spent in Agricultural Activities by Family Members

We now proceed to discuss the time spent in agricultural activities by family members. The analysis has been done in terms of the two main crops of the region (i.e. sugarcane and wheat) and other crops taken together.

Sugarcane Crop

The season of sugarcane lasts from April to February-March. In the study region ploughing is generally done by tractor. Women do not participate in this activity. However, before ploughing of land is done woman help in preparing land by burning, digging and removing stalks from the field. Boys also help in land preparation but generally girls do not. After the land preparation dung spraying is done both by male and female family members. Sometimes boy also helps in dung spraying. Before sowing, seed of sugarcane is collected. Seed of sugarcane is collecting by both males and females. Seed collecting and cutting is highly labour-intensive, so besides family labour, exchange labour and hired labour is also used in this activity. Sowing is done by tractor. Irrigation, fertilizer and pesticide application and bandhai, are generally males. Weeding is exclusively a woman's job. Sometimes Children also participate and help their parents in *chilai* of sugarcane. After cutting and cleaning sugarcane is carried by bullock cart or tractor trolley to sugar mill or cane crusher. Generally female labour is used in loading sugarcane. Purchase of input, sale of produce and hiring of labour are done by male members.

Table 7 shows average number of persondays per hectare put in by male and female family workers in sugarcane cultivation by different activities. Total Person-days in sugarcane crop spent by women family members come to 40.7 per hectare, while male family members spend 191.1 Person-days per hectare in a year. About seven persondays are spent by boys and one man-day by girls.

Table 8 shows the distribution of family labour in sugarcane cultivation by sex and activity. Females perform 17 percent of total family labour on sugarcane cultivation by family members. Their contribution is as high as 45 percent in weeding. Women also contribute one sixth to one fourth of labour in activities like seed collection and cutting, *chilai, khudai* and loading. Their contribution in activities like irrigation, fertilizer application, pesticide, purchase and sale is nominal.

Wheat Crop

Ploughing of field for wheat is generally done by tractor by males. Women help in preparing field by removing waste materials and weeding. Cow dung spraying in the field is also a part of land preparation in wheat crop. Weeding in wheat is done in November-December, which is mostly done by women. Fertilizer application and pesticide spray done by men only. Harvesting is carried out manually in which both men and woman participate. Some farmers use harvesters for this purpose. Threshing is done by threshers. The mechanical threshing is done exclusively by men. However, woman and children also help by carrying harvested crop to the threshing place and to putting grain into bags. After threshing the grain and chaff are carried to the house for storage. Both men and woman engage in this activity and they work jointly. Cleaning and storage of grain is done exclusively by woman with the help of children it. Grain is sold either to the local trader or in nearby mandi (market). Sale of wheat is handled exclusively by men. Buying of agricultural inputs and hiring of labour is also done by the men.

Table 9 shows the persondays spent per hectare by family members in cultivation of wheat crop by type of activity. On an average 83.5 persondays are put in

by family labour in wheat cultivation per hectare. The contribution of female and male members is 26.2 persondays and 52.9 persondays respectively. Boys contribute 3.3 persondays, while girls contribute one persondays.

Table 10 shows the share of male and female family labour in wheat cultivation. Adult females contribute 31.4 percent of total labour days spent on wheat cultivation, while girls contribute another 1.3 percent. The share of adult males is 63.4 percent and that of boys 3.9 percent. Weeding, cleaning and storage is done almost exclusively by women. They also contribute 34 percent of labour in harvesting. Contribution of female labour is also substantial (between 20 and 30 percent) in land preparation, sowing, threshing and carrying produce to house. Their contribution is very low in other activities.

Other Crops

The sample farmers also grow a number of other crops like mustard, potato, rice, gram, jowar, bajra, barseem, barley, etc. However, area put under these crops is very small and output is mainly for household consumption. Generally these crops are grown in the *zaid* or rainy season. We have studied labour use in these crops taken together.

Table 11 shows average persondays spent per hectare on cultivation of other crops. Female family members spend 23 Person-days per hectare in cultivation of other crops, while male family workers spend on 86.4 persondays.

Table 12 shows the share of male and female family labour in total family labour used in other crops. Females contribute 21 percent of labour in cultivation of other crops and males contribute 80 percent. However, females contribute 52 percent of family labour in transplanting of paddy, 48.4 percent of family labour in weeding and 35 percent in threshing of other crops. The other important activities performed by them are related to land preparation, sowing, harvesting, and buying of inputs.

Total Family Labour Used in All Crops

In this section we have discussed the use of family labour in agricultural activities in cultivation of all crops by sex. Total persondays have been derived by adding persondays used for sugarcane, wheat and other crops. Family labour in agriculture comes to 433 persondays per hectare, out of which 90 persondays are contributed by women and 2.23 persondays by girls. The contribution of males and boys is 330.4 and 10.5 persondays respectively (Table 13).

Looking at the share of females in total family labour on farm shown in Table 14, we find that women contribute about one fourth of total family labour spent on cultivation. They are almost wholly responsible for cleaning and storage of grains and contribute a little more than 50 percent of labour in transplantation of paddy and harvesting of crops. They also participate extensively in activities like seed preparation and cutting, harvesting, chilai of cane, threshing and carrying of produce to home and contribute about one fourth to one third of labour spent on these activities. Other important activities performed by women are land preparation, sowing, digging and dung application. Women's share in activities related to irrigation, application of fertilizer and pesticides and sale of produce is negligible. Thus, a clear cut division of work is found in the employment pattern of family labour in agriculture. Use of modern machinery and inputs is exclusively man's domain. Men also control marketing of produce.

Table 15 presents the synoptic picture of family labour use per farm, per person and per hectare by major crops. Sugarcane is the most labour intensive crop. Labour use in sugarcane per hectare is almost three times of wheat crop and other crops. Almost three-fourth of total family labour is spent on sugarcane crop. Sugarcane accounts for 65 percent of female family labour and 76.5 percent of male family labour. Only 21 percent of female family labour and 11 percent of male family labour is spent on wheat crop. Other crops account for about 13 percent of family labour. Boys and girls also participate in activities related to sugarcane cultivation, which accounts for nearly 80 and 68 percent of their labour respectively. On the other hand, child labour is hardly used for other crops.

Share of Female Labour in Total Labour Use in Agriculture

We are now in a position to examine the contribution of female labour in total agricultural work on the sample farms. Table 16 shows use of family and hired labour per farm by sex. On average total 1029.2 persondays were spent on agriculture on the sample farms. Out of this 106.9 persondays were contributed by female family members and 132.7 persondays by female hired labour. The contribution of male family members was 429.3 persondays and that of hired male labour 360.3 persondays (Table 16).

Table 17 shows percentage share of family and hired labour in total labour use in agriculture. Female family labour contributes 10.4 percent of total labour use in agriculture and hired female labour contributes 12.9 percent. Thus roughly one fourth of agricultural labour is contributed by women workers in the study region. Male family workers contribute 41.7 percent of total agricultural work and hired male workers 23.3 percent.

The contribution of different groups varies from activity to activity. Work related to cleaning and storage of grains is done entirely by female family members. The next most important work performed by them is weeding where they contribute 25 percent of labour. In harvesting and loading of crops female family members contribute one fifth of total labour. Hired female workers share 75 percent of transplantation work and about one fourth of work related to weeding and seed collecting and cutting (in case of sugarcane). Hired male workers participate in nearly all activities. They contribute more than half of labour required for sowing, *khudai* and *bandhai*. More than one third work related to threshing, *chilai*, harvesting and fertilizing is also done by them.

Table 18 shows total labour use per hectare of net sown area on the sample farms. 492.6 persondays are spent per hectare of net sown area on the sample farms. Out of this 51.15 persondays are contributed by female family labour and 205.4 persondays by male family members. Hired female and male members contribute 63.5 and 172.4 persondays respectively.

Table 19 shows total labour use per hectare of gross sown area on the sample farms.330persondays are spent per hectare of gross sown area on the sample farms. Out of this 34.3 persondays are contributed by female family labour and 137.6 persondays by male family members. Hired female and male members contribute 42.5 and 115.5 persondays respectively.

Table 20 shows total labour use on the sample farms by major crops. Total persondays per farm come to 840 in case of sugarcane, 11 in case of wheat and 75 in case of other crops. Family female labour provides 70 persondays on sugarcane, 23.5 persondays on wheat and 13.8 persondays on other crops. The corresponding figures for male family labour are 329, 48.3 and 51.9 persondays respectively. Figure1 shows contribution of female labour in total labour input on sample farms by major crops. Female family labour contributes about 10 percent of total labour input in agriculture on the sample farms. They contribute 21 percent of labour input in wheat crop and about 18 percent in other crops, while their contribution in sugarcane crop is only 8.3 percent, even though they spend about 65 percent of their labour time in agriculture on this crop. Male family members contribute about 40 percent of labour input in sugarcane and wheat and almost 70 percent of labour input in other crops. Hired labour contributes over half of labour input in sugarcane and about one third input in wheat. Its share in other crops is nominal.

Sugarcane accounts for over 80 percent of total labour input on the same farms (Figure 2). Wheat accounts for hardly 11 percent labour input and other crops around 7 percent.

Table 22 shows total labour use in cultivation per hectare by major crops. Sugarcane is the most labour intensive crop. It requires 506 persondays per hectare. Labour use in wheat and other crops is much less being 129.3 and 125.6 persondays for wheat and other crops respectively.

Conclusion

From forgoing analysis we find that women's participation in agricultural activities is quite widespread and women engage in most of the agricultural operations. On average 536 persondays per farm are spent in cultivation related activities by family members. Out of this women family members contribute 104 persondays and men contribute 415 persondays. The contribution of boys and girls is 14 and 3 persondays respectively. Family labour in agriculture comes to 433 persondays per hectare, out of which 90 persondays are contributed by women and 2.23 persondays by girls. The contribution of males and boys is 330.4 and 10.5 persondays respectively.

Women contribute about one fourth of total family labour spent on cultivation. Their contribution, however, varies from activity to activity. They are almost wholly responsible for cleaning and storage of grains and contribute a little more than 50 percent of labour in transplantation of paddy and harvesting of crops. They also participate extensively in activities like seed preparation and cutting, harvesting, *chilai* of cane, threshing and carrying of produce to home and contribute about one fourth to one third of labour spent on these activities. Other important activities performed by women are land preparation, sowing, digging and dung application. Women's share in activities related to irrigation, application of fertilizer and pesticides and sale of produce is negligible.

Sugarcane is the most labour intensive crop. Labour use in sugarcane per hectare is almost three times of wheat crop and other crops. Almost three-fourth of total family labour is spent on sugarcane crop. Sugarcane accounts for 65 percent of female family labour and 76.5 percent of male family labour. Only 21 percent of female family labour and 11 percent of male family labour is spent on wheat crop. Other crops account for about 13 percent of family labour. Boys and girls also participate in activities related to sugarcane cultivation, which accounts for nearly 80 and 68 percent of their labour respectively. On the other hand, child labour is hardly used for other crops.

Hired labour contributes 31.6 percent of labour on all sample farms. The use of hired labour increases with the increase in the size of land holdings. Thus, hired labour contributes only 15 percent of total labour on marginal farms, 29.4 percent of labour on small farms and around 39 percent of labour on medium and large farms. The use of hired labour also varies according to crops on all size holdings. Thus, the share of hired labour in total labour comes to 40 percent in case of sugarcane, 25 percent in case of wheat and only 9 percent in case of other crops. This relationship also holds true for each farm size category.

On average total 1029.2 persondays were spent on agriculture on the sample farms. Out of this 106.9 persondays were contributed by female family members and 132.7 persondays by female hired labour. The contribution of male family members was 429.3 persondays and that of hired male labour 360.3 persondays.

Female family labour contributes about 10 percent of total labour input in agriculture on the sample farms. They contribute 21 percent of labour input in wheat crop and about 18 percent in other crops, while their contribution in sugarcane crop is only 8.3 percent, even though they spend about 65 percent of their labour time in agriculture on this crop. Male family members contribute about 40 percent of labour input in sugarcane and wheat and almost 70 percent of labour input in other crops. Hired labour contributes over half of labour input in sugarcane and about input in sugarcane and about one

third input in wheat. Its share in other crops is nominal.

The participation of woman in agriculture in terms of persondays spent is more in district Baghpat than that in district Muzaffarnagar. In district Baghpat woman's participation is higher in sugarcane crop than in Muzaffarnagar, while it is lower in case of other crops in Baghpat than in Muzaffarnagar. Use of female labour is almost the same in the two districts in the case of wheat cultivation. A larger proportion of woman engaged in wheat crop as compared to sugarcane and other crops. This is necessitated by the need of timely harvesting of wheat crop as land has to be prepared for the next crop.

From the analysis of labour use in agriculture one observes a clear segregation in the agricultural activities by sex. Weeding, cleaning grain and storage of grain are done exclusively by women. Activities related to land preparation, irrigation, spraying fertilizer and pesticides are generally done by men. Other agricultural operations such as seed collection, dung spraying, sowing, transplanting, harvesting, threshing, and carrying the grains to home are jointly done by the men and woman. But all market related activities like buying agricultural inputs and hiring labour and sale of output are exclusively done by the male members, generally the head of the family.

One can conclude from the above analysis that while women share a large burden of agricultural activities, they are assigned an inferior role. Tasks requiring use of machines, new inputs and market related activities are controlled by men. Women are mostly involved in lighter manual work and work not related to marketing activities.

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Tables and Graphs

		Muzaffarnagar		Bag	hpat	Uttai	r Pradesh
Net area sown and	et area sown and % Share 326387 (77.44)		110381 (81.77)		16573478 (68.48)		
Per capita net area s	sown (ha.)	0	.08	0.	.09		0.09
Cropping intensity		14	4.75	15	8.79	1	53.34
Percentage of net ir area sown	rigated area to net	9	9.1	96.7 80.		80.3	
Irrigation intensity		14	4.72	164	4.22	1	44.35
Average size of hol	dings (ha.)	1	.11	1.	1.00 0.83		0.83
Total Livestock (No	o.)/ NSA (ha.)		3		4	3	
Per Capita Net Proc	luct (Rs.)	20	468	24	009	1	4685
		Total	Rural	Total	Rural	Total	Rural
	Persons (In, 000)	3543	2639	1163	934	166539	132000
Population, 2001	%Male	53.45	53.58	54.13	54.27	52.69	52.53
	% Female	46.55	46.42	45.87	45.73	47.31	47.47
Literacy Rate, 2001	Literacy Rate, 2001		58.83	64.24	63.31	56.27	52.53
Work Participation	Rate, 2001	33.11	35.14	32.67	33.88	32.48	33.93

Table 1: Socio-Economic Profile of the Study Area, 2006-07

Source: Statistical abstract of Uttar Pradesh 2008-09 and Census of India 2001

Table 2: Work Participation Rates in Agriculture by Sex and Size of Farm (%)

Sex/Category	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	All Farmers
Female	23.17	19.27	19.64	15.84	19.75
Male	44.67	49.19	53.73	48.95	48.83
Boy	11.14	8.02	6.22	11.59	9.24
Girl	3.27	0.92	1.52	1.14	1.99

Source: Based on primary data

Table 3: Family Labour Participation in Sugarcane Cultivation by Activity (Percent)

Type of Activity	Female	Male	Boy	Girl	Total
Land Preparation	19.02	61.30	4.82	1.48	31.75
Dung Spraying	18.16	67.41	12.05	3.70	35.00
Seed collection	41.24	76.37	19.28	5.19	48.17
Sowing	32.05	79.84	31.33	4.44	47.62
Irrigation	4.06	59.47	4.22	0.00	25.24
Weeding	44.02	60.29	7.83	7.41	41.67
Khudai	20.94	64.97	15.66	3.70	35.56
Fertilizing	4.70	57.43	5.42	0.00	24.84
Pesticide Spraying	5.56	66.19	14.46	0.00	29.76
Bhandhai	2.56	48.27	3.61	0.00	20.24
Chilai	29.91	62.93	13.25	3.70	37.78
Loading	30.34	70.06	17.47	3.70	41.27
Buying of Inputs	5.56	47.86	0.00	0.00	20.71
Sale of Crop	0.21	50.51	13.25	0.00	21.51
Hiring of Labour	8.12	46.23	0.00	0.00	21.03
Total	17.76	61.28	10.84	2.22	32.14

Type of Activity	Female	Male	Boy	Girl	Total
Land Preparation	22.86	61.71	3.61	0.00	33.02
Dung Spraying	20.09	68.23	9.64	0.00	35.32
Irrigation	1.92	58.66	0.60	0.00	23.65
Sowing	29.06	65.78	4.22	0.00	36.98
Weeding	36.54	0.61	0.00	0.00	13.81
Fertilizing	1.92	53.36	3.01	0.00	21.90
Pesticides	1.07	60.29	31.93	0.00	28.10
Harvesting	46.58	69.25	16.87	11.85	47.78
Threshing	44.44	79.02	62.05	11.11	56.67
Carrying of Grain	44.23	76.58	63.86	3.70	55.08
Carrying of chaff	43.38	78.82	64.46	3.70	55.71
Cleaning of Grain	72.01	0.00	0.00	17.04	28.57
Storage of grain	72.86	0.00	4.22	12.59	28.97
Buying Input	0.85	48.27	1.20	0.00	19.29
Sale of crop	1.71	43.79	0.00	0.00	17.70
Hiring of labour	4.06	46.44	0.00	0.00	19.60
Total	27.72	50.67	16.60	3.75	32.63

Table 4: Percentage of Family Labour Participation in Wheat Cultivation by Activity(Percent)

Source: Based on primary data

Table 5: Family Labour Participation in Cultivation of Other Crops by Activity (Percent)

Type of Activity	Female	Male	Boy	Girl	Total
Land Preparation	16.88	58.66	0.00	0.00	29.13
Dung Spraying	0.00	11.20	0.00	0.00	4.37
Irrigation	0.21	41.75	0.00	0.00	16.35
Transplantation	7.48	6.92	0.00	0.00	5.48
Sowing	20.51	60.08	0.00	0.00	31.03
Weeding	30.77	34.62	0.00	0.00	24.92
Harvesting	41.24	64.97	3.01	0.00	41.03
Threshing	23.72	40.94	0.00	0.00	24.76
Buying of Inputs	10.47	23.42	0.00	0.00	13.02
Sale of Crops	0.00	6.52	0.00	0.00	2.54
Hiring of Labour	0.00	30.75	0.00	0.00	11.98
Total	13.75	34.53	0.27	0.00	18.60

Type of Activity	Female	Male	Boy	Girl	Total
Land Preparation	20.0	60.6	2.8	0.5	31.5
Dung Spraying	12.9	48.9	7.2	1.2	24.9
Irrigation	2.1	53.3	1.6	0.0	21.7
Sowing	27.4	68.6	11.8	1.5	38.6
Weeding	37.7	31.8	2.6	2.5	27.0
Transplantation	3.3	55.4	4.2	0.0	23.4
Fertilizing	3.3	63.2	23.2	0.0	28.9
Pesticide Spraying	7.5	6.9	0.0	0.0	5.5
Seed Collection	43.2	76.4	19.3	5.2	48.9
Khudai	22.6	65.0	15.7	3.7	36.2
Bhandhai	2.6	48.3	3.6	0.0	20.2
Chilai	31.4	62.9	13.3	3.7	38.3
Harvesting	43.9	67.1	9.9	5.9	44.4
Threshing	34.1	60.0	31.0	5.6	40.7
Loading	39.7	75.2	48.6	3.7	50.8
Storage	72.4	0.0	2.1	14.8	28.8
Buying of Inputs	5.6	39.9	0.4	0.0	17.7
Sale of crop	0.6	33.6	4.4	0.0	13.9
Hiring of labour	4.1	41.1	0.0	0.0	17.5
Total	21.8	50.4	10.6	2.5	29.4

 Table 6: Family Labour Participation in Cultivation of All Crops (Percent)

Table 7: Person-days of Family Labour Per Hectare in Sugarcane Cultivation

Type of Activity	Females	Males	Boys	Girls	Total
Land Preparation	0.5	2.4	0.1	0.0	3.0
Dung Application	0.5	3.7	0.2	0.0	4.4
Seed collecting/Cutting	1.3	3.2	0.3	0.0	4.7
Sowing	0.3	3.3	0.4	0.0	4.1
Irrigation	0.4	14.4	0.1	0.0	14.9
Weeding	6.9	7.7	0.5	0.2	15.2
Khudai	1.8	8.1	0.6	0.1	10.7
Fertilizing	0.1	3.5	0.1	0.0	3.7
Pesticide	0.1	1.8	0.2	0.0	2.0
Bandhai	0.4	13.8	0.2	0.0	14.4
Chilai	22.7	76.2	2.5	0.7	102.1
Transport of Cane	5.4	18.1	1.6	0.1	25.2
Buying of Inputs	0.2	3.5	0.0	0.0	3.7
Sales of crop	0.0	29.1	0.3	0.0	29.4
Hiring of labour	0.3	2.3	0.0	0.0	2.7
Total	40.7	191.1	7.1	1.1	240.1

Type of Activity	Female	Male	Воу	Girl	Total
Land Preparation	15.6	81.4	3.0	0.0	100.0
Dung Application	11.8	84.2	3.6	0.4	100.0
Seed collecting/Cutting	26.4	67.3	5.8	0.4	100.0
Sowing	8.5	80.8	10.4	0.3	100.0
Irrigation	2.4	96.9	0.7	0.0	100.0
Weeding	45.2	50.5	3.1	1.2	100.0
Khudai	17.2	76.2	5.9	0.7	100.0
Fertilizing	1.8	94.4	3.8	0.0	100.0
Pesticide	3.0	87.6	9.5	0.0	100.0
Bandhai	2.8	95.6	1.6	0.0	100.0
Chilai	22.2	74.6	2.5	0.7	100.0
Transport of Cane	21.3	72.0	6.2	0.5	100.0
Buying of Inputs	5.2	94.8	0.0	0.0	100.0
Sales of crop	0.0	99.0	1.0	0.0	100.0
Hiring of labour	11.8	88.2	0.0	0.0	100.0
Total	17.0	79.6	3.0	0.5	100.0

Table 8: Percentage Distribution of Person-days by Family Labour in Sugarcane Cultivation

Table 9: Person-days Put in by Family Workers Per Hectare in Wheat Cultivation

Type of Activity	Females	Males	Boys	Girls	Total
Land Preparation	0.6	2.4	0.0	0.0	3.0
Dung Application	0.7	4.2	0.1	0.0	5.0
Irrigation	0.1	8.2	0.0	0.0	8.3
Sowing	0.7	2.5	0.1	0.0	3.2
Weeding	2.7	0.0	0.0	0.0	2.8
Fertilizing	0.0	1.2	0.0	0.0	1.3
Pesticide Spraying	0.0	1.1	0.1	0.0	1.3
Harvesting	10.9	19.2	1.2	0.7	32.1
Threshing	1.4	3.3	0.5	0.1	5.2
Carrying Grain to house	1.0	2.0	0.4	0.0	3.4
Carrying chaff to house	2.0	4.4	0.8	0.0	7.3
Cleaning Grain	3.4	0.0	0.0	0.2	3.5
Storage	2.4	0.0	0.0	0.1	2.5
Buying of Inputs	0.0	2.5	0.0	0.0	2.6
Sale of crop	0.0	0.3	0.0	0.0	0.3
Hiring of labour	0.2	1.6	0.0	0.0	1.8
Total	26.2	52.9	3.3	1.1	83.5

Type of Activity	Female	Male	Boy	Girl	Total
Land Preparation	19.2	80.8	0.0	0.0	100.0
Dung Application	14.0	83.7	2.3	0.0	100.0
Irrigation	1.4	98.6	0.0	0.0	100.0
Sowing	22.2	77.8	0.0	0.0	100.0
Weeding	100.0	0.0	0.0	0.0	100.0
Fertilizing	0.0	100.0	0.0	0.0	100.0
Pesticide Spraying	0.0	90.9	9.1	0.0	100.0
Harvesting	34.2	60.0	3.6	2.2	100.0
Threshing	26.7	62.2	8.9	2.2	100.0
Carrying Grain to house	31.0	58.6	10.3	0.0	100.0
Carrying chaff to house	27.4	61.3	11.3	0.0	100.0
Cleaning Grain	96.7	0.0	0.0	3.3	100.0
Storage	95.5	0.0	0.0	4.5	100.0
Buying of Inputs	0.0	100.0	0.0	0.0	100.0
Sale of crop	0.0	100.0	0.0	0.0	100.0
Hiring of labour	13.3	86.7	0.0	0.0	100.0
Total	31.5	63.6	3.6	1.3	100.0

Table 10: Percentage Distribution of Person-days of Family Labour in Wheat Cultivation

Table 11 :Person-days Put in by Family Workers Per Hectare in Cultivation of Other Crops

Type of Activity	Females	Males	Boys	Girls	Total
Land Preparation	1.3	6.6	0.0	0.0	8.0
Dung Application	0.0	0.9	0.0	0.0	0.9
Irrigation	0.0	8.8	0.0	0.0	8.8
Transplanting of paddy	0.4	0.3	0.0	0.0	0.7
Sowing	1.5	6.9	0.0	0.0	8.4
Weeding	5.1	5.5	0.0	0.0	10.6
Harvesting	12.7	51.3	0.1	0.0	64.1
Threshing	1.5	2.8	0.0	0.0	4.3
Buying of Inputs	0.5	1.6	0.0	0.0	2.1
Sale of crop	0.0	0.4	0.0	0.0	0.4
Hiring of labour	0.0	1.4	0.0	0.0	1.4
Total	23.0	86.4	0.1	0.0	109.5

Type of Activity	Female	Male	Boy	Girl	Total
Land Preparation	16.7	83.3	0.0	0.0	100.0
Dung Application	0.0	100.0	0.0	0.0	100.0
Irrigation	0.0	100.0	0.0	0.0	100.0
Transplanting of paddy	50.0	50.0	0.0	0.0	100.0
Sowing	18.0	82.0	0.0	0.0	100.0
Weeding	48.4	51.6	0.0	0.0	100.0
Harvesting	19.7	80.0	0.3	0.0	100.0
Threshing	34.6	65.4	0.0	0.0	100.0
Buying of Inputs	25.0	75.0	0.0	0.0	100.0
Sale of crop	0.0	100.0	0.0	0.0	100.0
Hiring of labour	0.0	100.0	0.0	0.0	100.0
Total	21.0	78.8	0.2	0.0	100.0

Table 12: Percentage Distribution of Person-days of Family Labour in Other Crops

Source: Based on primary data

Table 13: Person-days Per Hectare of Family Labour in Different Agricultural Activities

Type of Activities	Female	Male	Boy	Girl	Total
Land Preparation	2.40	11.47	0.13	0.00	14.00
Dung Application	1.18	8.75	0.30	0.02	10.25
Irrigation	0.49	31.36	0.11	0.00	31.96
Sowing	2.53	12.67	0.48	0.01	15.69
Transplantation	0.36	0.33	0.00	0.00	0.69
Weeding	14.73	13.18	0.47	0.19	28.56
Fertilizing	0.10	4.70	0.17	0.00	4.97
Spraying Pesticide	0.07	2.92	0.31	0.00	3.30
Digging	1.84	8.14	0.63	0.08	10.68
Seed collecting/Cutting	1.25	3.19	0.28	0.02	4.74
Bandhai of Cane	0.41	13.78	0.23	0.00	14.42
Chilai of Cane	22.66	76.21	2.54	0.71	102.12
Harvesting	23.60	70.50	1.34	0.72	96.17
Threshing	2.90	6.07	0.48	0.06	9.51
Carrying of produce	8.34	24.51	2.78	0.17	35.80
Cleaning and Storage	5.81	0.00	0.01	0.25	6.08
Buying of Inputs	0.72	7.60	0.01	0.00	8.33
Sale of crop	0.03	29.74	0.29	0.00	30.06
Hiring of labour	0.51	5.26	0.00	0.00	5.77
Total	89.95	330.38	10.54	2.24	433.11

Type of Activities	Female	Male	Boy	Girl	Total
Land Preparation	17.12	81.93	0.93	0.02	100.00
Dung Application	11.55	85.33	2.93	0.18	100.00
Irrigation	1.52	98.12	0.35	0.00	100.00
Sowing	16.14	80.73	3.04	0.08	100.00
Transplantation	51.96	48.04	0.00	0.00	100.00
Weeding	51.56	46.14	1.64	0.66	100.00
Fertilizing	2.03	94.51	3.46	0.00	100.00
Spraying Pesticide	2.27	88.46	9.27	0.00	100.00
Digging	17.19	76.22	5.86	0.73	100.00
Seed collecting/Cutting	26.42	67.32	5.82	0.43	100.00
Bandhai of Cane	2.86	95.57	1.57	0.00	100.00
Chilai of Cane	22.19	74.63	2.49	0.69	100.00
Harvesting	24.54	73.31	1.39	0.75	100.00
Threshing	30.46	63.84	5.03	0.67	100.00
Carrying of produce	23.30	68.46	7.76	0.48	100.00
Cleaning and Storage	95.60	0.00	0.24	4.16	100.00
Buying of Inputs	8.69	91.23	0.09	0.00	100.00
Sale of crop	0.11	98.93	0.96	0.00	100.00
Hiring of labour	8.81	91.19	0.00	0.00	100.00
Total	20.77	76.28	2.43	0.52	100.00

 Table 14: Percentage Distribution of Persondays of Family Labour in Cultivation of All Crops by Type of Activity and Sex

Table 15: Family Labour Use in Agriculture On Sample Farms (in Persondays)

Crop	Male	Female	Boys	Girls	Total			
Per Farm								
Sugarcane	67.6	317.3	11.8	1.9	398.6			
Wheat	22.5	45.4	2.6	0.9	71.4			
Others	13.8	51.8	0.1	0.0	65.7			
Total	104.0	414.6	14.7	2.8	536.1			
	Per Person							
Sugarcane	36.1	163.0	15.7	3.2	218.1			
Wheat	12.0	23.4	3.8	1.6	40.8			
Others	7.4	26.6	0.1	0.0	34.1			
Total	55.5	213.0	19.6	4.8	293.0			
	Per Hectare							
Sugarcane	40.7	191.1	7.1	1.1	240.1			
Wheat	26.2	52.9	3.3	1.1	83.5			
Others	23.0	86.4	0.1	0.0	109.5			
Total	49.8	198.4	7.0	1.3	256.5			

(Persondays/Per Farm)							
Type of Activity	Family L	abour	Hired La	Total			
	Female	Male	Female	Male	Persondays		
Land Preparation	2.1	10.3	0.0	4.2	16.5		
Dung Spraying	1.5	10.6	0.0	4.8	16.9		
Irrigation	0.7	36.4	0.0	8.1	45.2		
Sowing	2.1	12.5	0.0	17.0	31.6		
Weeding	17.1	16.8	16.4	18.0	68.4		
Transplantation	0.4	0.3	5.6	1.2	7.4		
Fertilizing	0.1	7.1	0.0	3.8	11.0		
Pesticide	0.1	4.4	0.0	1.8	6.3		
Seed collection/Cutting	2.1	5.8	5.3	7.5	20.7		
Khudai	3.2	14.5	0.0	17.9	35.7		
Bhandhai	0.7	23.3	0.0	55.3	79.2		
Chilai	38.8	130.7	82.5	152.0	404.0		
Loading	17.6	48.4	6.7	17.1	89.8		
Harvesting	2.2	4.9	0.8	4.1	11.9		
Threshing	11.7	39.2	14.9	46.2	112.1		
Cleaning Grain/Storage	5.2	0.0	0.0	0.0	5.2		
Buying of Inputs	0.6	8.9	0.5	0.8	10.9		
Sales of crop	0.0	49.2	0.0	0.0	49.3		
Hiring of labour	0.7	6.0	0.0	0.5	7.3		
Total	106.9	429.3	132.7	360.3	1029.2		

Table 16: Total Labour Use in Different Agricultural Activities by Sex

Table 17: Percentage Share of Family and Hired labour in Total Labour Use in Different Agricultural Activities Per Farm By Sex

Type of Activity	Family Labour		Hired Labour		Total Labour	
	Female	Male	Female	Male	Female	Male
Land Preparation	12.7	62.0	0.0	25.3	12.7	87.3
Dung Spraying	8.9	62.7	0.0	28.4	8.9	91.1
Irrigation	1.5	80.5	0.0	17.9	1.5	98.5
Sowing	6.6	39.6	0.0	53.8	6.6	93.4
Weeding	25.0	24.6	24.0	26.3	49.0	50.9
Transplantation	5.3	4.0	74.7	16.0	80.0	20.0
Fertilizing	0.9	64.5	0.0	34.5	0.9	99.1
Pesticide	1.6	69.8	0.0	28.6	1.6	98.4
Seed collecting/Cutting	10.1	28.0	25.6	36.2	35.7	64.3
Khudai	9.0	40.6	0.0	50.1	9.0	90.8

Bandhai	0.9	29.4	0.0	69.8	0.9	99.2
Chilai	9.6	32.4	20.4	37.6	30.0	70.0
Loading	19.6	53.9	7.5	19.0	27.1	72.9
Harvesting	18.5	41.2	6.7	34.5	25.2	75.6
Threshing	10.4	35.0	13.3	41.2	23.7	76.2
Cleaning Grain/Storage	100.0	0.0	0.0	0.0	100.0	0.0
Buying of Inputs	5.5	81.7	4.6	7.3	10.1	89.0
Sale of crop	0.0	99.8	0.0	0.0	0.0	99.8
Hiring of labour	9.7	83.3	0.0	6.9	9.7	90.3
Total	10.4	41.7	12.9	35.0	23.3	76.7

Table 18: Total Labour Use in Different Agricultural Activities Per Hectare of Net Sown Area (in Persondays)

Type of Activity	Family Labour		Hired l	Total	
	Female	Male	Female	Male	Persondays
Land Preparation	1.00	4.93	0.00	2.01	7.94
Dung Spraying	0.72	5.07	0.00	2.30	8.09
Irrigation	0.33	17.42	0.00	3.88	21.63
Sowing	1.00	5.98	0.00	8.13	15.12
Weeding	8.18	8.04	7.85	8.61	32.73
Transplantation	0.19	0.14	2.68	0.57	3.59
Fertilizing	0.05	3.40	0.00	1.82	5.26
Pesticide	0.05	2.11	0.00	0.86	3.01
Seed collection/Cutting	1.00	2.78	2.54	3.59	9.90
Khudai	1.53	6.94	0.00	8.56	17.08
Bhandhai	0.33	11.15	0.00	26.46	37.89
Chilai	18.56	62.54	39.47	72.73	193.30
Loading	8.42	23.16	3.21	8.18	42.97
Harvesting	1.05	2.34	0.38	1.96	5.69
Threshing	5.60	18.76	7.13	22.11	53.64
Cleaning Grain/Storage	2.49	0.00	0.00	0.00	2.49
Buying of Inputs	0.29	4.26	0.24	0.38	5.22
Sales of crop	0.00	23.54	0.00	0.00	23.59
Hiring of labour	0.33	2.87	0.00	0.24	3.44
Total	51.15	205.41	63.49	172.39	492.58

Type of Activity	Family Labour		Hired I	Hired Labour		
	Female	Male	Female	Male	Persondays	
Land Preparation	0.67	3.30	0.00	1.35	5.32	
Dung Spraying	0.48	3.40	0.00	1.54	5.42	
Irrigation	0.22	11.67	0.00	2.60	14.49	
Sowing	0.67	4.01	0.00	5.45	10.13	
Weeding	5.48	5.38	5.26	5.77	21.92	
Transplantation	0.13	0.10	1.79	0.38	2.40	
Fertilizing	0.03	2.28	0.00	1.22	3.53	
Pesticide	0.03	1.41	0.00	0.58	2.02	
Seed collection/Cutting	0.67	1.86	1.70	2.40	6.63	
Khudai	1.03	4.65	0.00	5.74	11.44	
Bandhai	0.22	7.47	0.00	17.72	25.38	
Chilai	12.44	41.89	26.44	48.72	129.49	
Loading	5.64	15.51	2.15	5.48	28.78	
Harvesting	0.71	1.57	0.26	1.31	3.81	
Threshing	3.75	12.56	4.78	14.81	35.93	
Cleaning Grain/Storage	1.67	0.00	0.00	0.00	1.67	
Buying of Inputs	0.19	2.85	0.16	0.26	3.49	
Sales of crop	0.00	15.77	0.00	0.00	15.80	
Hiring of labour	0.22	1.92	0.00	0.16	2.31	
Total	34.26	137.60	42.53	115.48	329.97	

Table 19: Total Labour Use in Different Agricultural Activities Per Hectare of Gross Sown Area (in Persondays)

Source: Based on primary data

Table 20: Total Labour Used in Different Crops Per Farm (in Persondays)

Type of Activity	Family	y Labour	Hired L	Total		
- , - , - , - , - , - , - , - , - , - ,	Female	Male	Female	Male	Total	
Sugarcane	69.54	329.06	118.74	322.51	839.85	
Wheat	23.46	48.31	5.97	33.4	111.14	
Other Crops	13.81	51.91	5.73	3.9	75.36	
Total	106.81	429.28	130.44	359.81	1026.35	



Figure 1: Percent Share of Female Family Labour in Different Crops in Total Labour Use By Major Crops

Source: Based on primary data



Figure 2: Percent Share of different Crops in Total Labour Use Per Farm

Source: Based on primary data

Type of Activities	Family Labour		Hired		
	Female	Male	Female	Male	Iotai
Sugarcane	41.90	198.20	71.50	194.30	505.90
Wheat	27.28	56.17	6.94	38.84	129.23
Other Crops	23.02	86.52	9.55	6.51	125.59
Total Per Hectare of GSA	34.26	137.60	42.53	115.48	329.97

Table 22: Total Labour Used in Different Crops PerHectare (in Persondays)