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TABLE VIII. RELATIONSHIP BETWEEN FEMALE PARTICIPATION IN AGRICULTURE AND ECONOMIC-DEMOGRAPHIC CHARACTERISTICS

Economic-demographic characteristics	Female labour utilization per cultivating household (hours)					
	Family female labour		Hired female labour		Total female labour	
	1977-78	1982-83	1977-78	1982-83	1977-78	1982-83
(A) Per capita income group (Rs.)						
Upto 700	95	201	4	5	99	206
701-1,000	161	134	35	6	196	140
1,001-1,500	189	126	26	7	215	133
1,501-2,000	273	72	125	32	398	104
2,001-2,500	210	314	25	50	235	364
2,501-3,000	187	52	167	-	354	52
Above 3,000	218	297	157	90	375	387
(B) Castewise groups						
Upper class	31	33	54	21	85	54
Backward class	349	281	95	32	444	313
SCs and STs	246	204	8	9	254	213
Others (Muslims)	-	102	80	3	80	105

IMPACT OF HIGH-YIELDING VARIETIES ON EMPLOYMENT POTENTIAL OF FEMALE LABOUR — A STUDY IN AKOLA DISTRICT (MAHARASHTRA)

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In recent years there has been more reliance on the agricultural sector in India for employment creation. Structural changes have been effected to transform traditional low productivity agriculture into high productivity agriculture and to provide employment to the rual people. Introduction of high-yielding varieties (HYVs) is one of the important factors which has increased agricultural production and created employment opportunities in the rural sector both for male and female labour. However, empirical studies to evaluate the employment implications of HYVs for female labour are limited. The present study is an attempt in this direction. The specific objective of the present study is to evaluate the impact of HYVs on female labour employment by size-groups of holdings. The study also attempts to find out the employment effect of HYVs separately for family and hired female labour.

METHODOLOGY

The study pertains to the year 1980-81 and is located in Akola district of Maharashtra State. Cotton and jowar which are the important crops occupying about 70 per cent of the total cropped area of the district and subjected to technological change in the form of HYVs were selected for the present study. Data collected by the Agricultural Prices Scheme of the Punjabrao Krishi Vidyapeeth, Akola were used for the present study. The sampling procedure consisted of three-stage stratified sampling plan with homogeneous crop growing

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zones as strata, tahsil as primary unit, a cluster of three villages as secondary unit and operational holding within the cluster as the ultimate unit of sampling.

The study is based on the data of 174 cultivators from small, medium and large category growing high-yielding and local varieties of cotton and jowar crop. Small cultivators had land holdings upto 2 hectares each while medium and large farmers had land holdings of 2.01 to 4 hectares and above 4 hectares respectively. Table I gives details of the sample selected for the study.

TABLE I. DISTRIBUTION OF SELECTED HOLDINGS BY SIZE-GROUP AND CROP VARIETIES

Size-group	Number of holdings selected			
	Cotton		Jowar	
	HYV	Local	HYV	Local
Small	10	10	10	10
Medium	15	15	15	15
Large	20	18	20	16

Information on labour use for different operations for high-yielding and local varieties of cotton and jowar crop was collected to accomplish the objectives of the study.

RESULTS AND DISCUSSION

Per hectare operationwise and total labour use for high-yielding as well as local varieties of cotton and jowar crop was estimated to assess the impact of HYVs on female labour use in different size-groups of farms. The results obtained are presented and discussed cropwise in the following paras.

Cotton

Table II presents information on per hectare labour use for high-yielding and local varieties of cotton in different size groups of farms. As evident from the table, HYV of cotton required about 743 hours of female labour as against about 289 hours in local variety for the sample as a whole. In terms of percentage, the HYV cotton required about 157 per cent more female labour over the local variety.

TABLE II. LABOUR UTILIZATION FOR DIFFERENT OPERATIONS FOR COTTON CROP

(hours/ha.)

Sr. No.	Name of operation	Small				Medium				Large				All farms			
		Male		Female		Male		Female		Male		Female		Male		Female	
		HYV	Local	HYV	Local	HYV	Local	HYV	Local	HYV	Local	HYV	Local	HYV	Local	HYV	Local
1.	Preparatory tillage	88.8	114.0	72.3	65.1	100.8	56.4	56.5	22.5	79.7	73.4	32.8	16.0	86.9	73.0	42.3	20.1
2.	Manuring	—	32.2	—	—	29.6	9.4	4.4	—	8.5	11.1	3.2	—	14.9	12.1	5.3	—
3.	Fertilizer application	23.4	10.7	34.0	1.3	5.1	3.5	79.5	5.2	1.7	0.5	42.4	9.7	3.8	1.6	53.9	8.7
4.	Sowing	23.4	17.2	54.2	16.7	16.2	17.3	60.5	14.5	14.7	11.9	47.5	25.4	15.6	13.2	52.0	23.1
5.	Interculture	77.2	171.5	117.0	244.5	68.5	74.9	241.3	123.8	143.9	90.0	249.8	137.0	116.6	92.4	240.8	141.3
6.	Plant protection	146.8	—	29.8	—	166.7	2.1	8.2	—	67.9	2.8	11.8	0.6	103.3	2.5	11.5	0.5
7.	Irrigation	—	—	—	—	26.2	—	1.4	—	1.7	—	2.5	—	9.5	—	2.1	—
8.	Harvesting	22.3	25.7	274.5	97.5	16.3	8.9	320.8	148.3	5.5	3.5	347.9	83.2	9.7	5.8	335.5	95.1
	Total	381.9	371.3	581.8	425.1	429.4	172.5	772.6	314.3	323.6	193.2	737.9	271.9	360.3	200.6	743.4	288.8

A study of the operationwise labour use revealed that fertilizer application, interculture and harvesting operation in HYV cotton required substantially higher female labour than the corresponding operations in local cotton. The HYV cultivation usually involves a new package of practices requiring greater care and more intensive use of labour. The HYV requires more intensive weeding especially where its cultivation is associated with higher level of fertilizer use. In the present study also, per hectare fertilizer use (N+P+K) in HYV cotton is observed to be much higher than local cotton (Table III). This has

TABLE III. FERTILIZER USE PER HECTARE FOR COTTON AND JOWAR CROP

(N+P+K in kg.)

Size-group	Cotton		Jowar	
	HYV	Local	HYV	Local
Small	73.14	25.89	56.25	-
Medium	36.67	6.31	43.37	9.28
Large	73.57	7.05	48.02	-
All farms	58.42	8.08	47.81	1.73

resulted in intensive interculture operations like weeding and thereby higher female labour use for this operation in HYV cotton. Secondly, the HYVs have a positive crop yield effect and therefore they require relatively more labour for harvesting operation. In so far as it relates to cotton, the positive crop yield effect increases female labour use as the cotton picking (*i.e.*, harvesting) is done by female labour only. It could be observed from Table IV that per hectare yield in HYV cotton for the sample as a whole was 5.81 quintals as against only 2 quintals in local cotton. A higher yield in HYV required more female labour for picking operation. Thus, the study revealed that fertilizer application, interculture (weeding) and harvesting opeations in HYV cotton required more labour and since these operations are primarily carried out by female labour only, they have increased female labour use on HYV cotton farms.

TABLE IV. PER HECTARE YIELD OF COTTON AND JOWAR

(quintals/ha.)

Size-group	Cotton		Jowar	
	HYV	Local	HYV	Local
Small	4.74	1.41	18.49	4.25
Medium	6.79	3.41	12.86	5.73
Large	5.39	1.75	10.99	3.62
All farms	5.81	2.01	11.86	4.20

As regards male labour, it could be observed from Table II that the HYV cotton farms used more male labour than the local cotton farms. In terms of percentage, per hectare male labour use in HYV cotton was 80 per cent more as against 157 per cent in the case of female labour. Interculture (weeding) and harvesting are the two important operations which increase labour use on HYV cotton farms. Participation of male labour in these operations is less as compared to female labour and therefore proportionate increase in male labour use on HYV cotton farms is less as compared to the increase in female labour use.

A study of the female labour use in different size-groups of farms revealed that HYV cotton farms used more female labour as compared to local cotton in all the size-groups.

In terms of percentage, however, the increase in female labour use on HYV cotton farms over local cotton was the highest on large farms followed by medium and small farms. This could be due to better financial position of large farmers who can afford to employ more labour and get the work done on time.

Jowar

Table V presents information on per hectare labour use for HYV jowar and local jowar in different size-groups of farms. Based on the entire sample, HYV jowar required about 305 female labour hours per hectare as against 242 hours in local jowar. Thus, HYV jowar required 26 per cent more female labour than local jowar. As in the case of cotton, fertilizer application, interculture and harvesting and threshing are the operations which required more female labour in HYV jowar. A higher level of female labour use in fertilizer application and interculture (weeding) in HYV jowar could be due to higher level of fertilizer use for this crop (Table III). As already mentioned, fertilizer application and interculture (weeding) operations are primarily carried out by female labour and as such female labour use in HYV jowar is more as compared to local jowar. A higher per

TABLE V. LABOUR UTILIZATION FOR DIFFERENT OPERATIONS FOR JOWAR CROP

(hours/ha.)

Sr. No.	Name of operation	Small				Medium				Large				All farms			
		Male		Female		Male		Female		Male		Female		Male		Female	
		HYV	Local	HYV	Local	HYV	Local	HYV	Local	HYV	Local	HYV	Local	HYV	Local	HYV	Local
1.	Preparatory tillage	81.1	77.1	33.4	67.3	102.9	76.8	42.9	69.3	83.8	69.7	29.3	26.6	87.2	71.6	32.0	37.3
2.	Manuring	6.5	—	69.2	—	8.7	5.1	—	0.5	5.2	0.4	10.5	—	6.0	1.2	12.7	0.1
3.	Fertilizer application	1.5	2.1	1.4	1.6	3.5	—	23.8	—	6.8	0.2	13.6	0.5	5.9	0.3	14.6	0.5
4.	Sowing	29.2	23.1	14.5	15.8	26.3	23.8	7.9	8.6	17.3	20.5	13.1	6.3	19.8	21.3	12.0	6.7
5.	Interculture	111.5	108.4	194.6	167.9	67.3	49.9	157.7	155.3	47.4	65.0	166.3	142.7	55.6	65.1	166.7	146.7
6.	Plant protection	4.6	—	—	—	17.6	—	1.0	—	9.2	—	1.1	—	10.3	—	1.0	—
7.	Irrigation	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8.	Harvesting and threshing	100.0	92.1	31.5	25.3	187.0	98.1	83.2	75.9	103.1	69.1	65.5	46.7	118.5	76.0	66.4	50.7
	Total	334.4	302.8	344.6	277.9	413.3	253.8	316.5	309.6	272.8	224.9	299.4	222.8	303.3	235.5	305.4	242.0

hectare yield in HYV jowar (Table IV) also required more female labour for harvesting and winnowing operations.

As regards male labour participation, it could be observed from Table V that HYV jowar farms required more male labour than local jowar per hectare to the extent of 29 per cent for the sample as a whole.

A study of the female labour use in different size-groups of farms revealed that HYV jowar farms used more female labour than local jowar in all the groups. The difference in per hectare female labour use in HYV and local jowar was comparatively more in small and large category of farms while in medium category farms it was only marginal.

Employment Implications of HYV for Hired Female Labour

By and large, the introduction of HYV crops increases the requirement of casual hired labour because of the higher peak labour needs and time boundness of operations like

fertilizer application, weeding and harvesting. These are the operations in which female labour participation is more and therefore one would expect an increase in the requirement of casually hired female labour on HYV farms. This is evidenced by the data presented in Table VI. It is observed from the table that for the sample as a whole

TABLE VI. FEMALE LABOUR UTILIZATION FOR COTTON AND JOWAR CROPS

(hours/ha.)

Size-group	Cotton				Jowar			
	HYV		Local		HYV		Local	
	Family	Hired	Family	Hired	Family	Hired	Family	Hired
Small	174.4	407.4	25.7	399.4	48.30	296.3	8.3	269.6
Medium	10.8	761.8	23.3	291.0	24.2	292.3	11.4	298.2
Large	7.9	730.0	4.9	267.0	4.0	295.4	-	222.8
All farms	18.5	724.9	9.6	279.2	2.8	302.6	2.7	239.3

HYV cotton farms used about 93 per cent more family female labour over local cotton farms as against 160 per cent in respect of hired female labour on per hectare basis. In jowar crop there was no difference in family female labour use on local and HYV farms. In respect of hired female labour, however, HYV farms used about 26 per cent more labour over local variety of jowar. Thus, the study revealed that the adoption of HYV of cotton and jowar increased the requirement of casually hired female labour to a large extent, implying thereby an increase in the employment opportunities for female labour seeking agricultural wage employment.

SUMMARY

The present study reveals that per hectare female labour use on HYV cotton and jowar farms is more as compared to the local variety farm. In cotton, HYV cotton farms used about 157 per cent more female labour per hectare over local variety, while in jowar crop, the HYV used 26 per cent more female labour over local variety. The adoption of HYV of cotton and jowar increased the requirement of casually hired female labour to a large extent, implying thereby an increase in the employment opportunities for female labour seeking agricultural wage employment.