

Assessment of drudgery reducing tool: harvest bag (cot bag) used by the farm women for harvesting chilli

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ABSTRACT

Women form the backbone of the agriculture comprising the majority of agricultural labourers in India. Technological empowerment of women is the need of the day for betterment of agriculture and agricultural production system. Hence the study was conducted on assessment of drudgery reducing tool, harvest bag (cot bag) used for chilli harvesting by the farm women. The study was conducted in Dharwad district of Karnataka state comprising 150 farm women. The field validation of cot bag used for harvesting chilli was increased on all the parameters with significant differences. Harvest bag showed positive and significant performance as compared to the traditional method in the various drudgery parameters like rating on work demand, manual loads operative, rating on difficulty perception and work load perception. Significant difference was not observed in feeling of exhaustion during work. Farm women gave maximum score to pain in lower back (5.80) followed by pain in knee (3.53) and upper back (2.87) while harvesting chilli using conventional method. Farm women gave maximum scores to pain in lower back (5.90) followed by pain in knee (3.70) and upper leg (3.47) in improved method of harvesting the chilli.

Keywords: Chilli; harvest bag; work load; perception; scores; body pain

INTRODUCTION

Chilli is one of the most important commercial crops of India. India contributes about 36 per cent to the total world production. In India chilli is grown in almost all the states throughout the country. Andhra Pradesh is the largest producer of chilli in India and contributes about 26 per cent to the total area under chilli followed by

Maharashtra (15%), Karnataka (11%), Orissa (11%), Madhya Pradesh (7%) and other states. Women are the major labour force in chilli production.

Women are the backbone of the development of rural and national economy. Agriculture is the main alternative for rural women and it should come with better access to land and

resources for the prevention, adaptation and mitigation of climate change combined with rural women learning how to deal with cultural resistance and adapting to various manifestations of this phenomenon (Krishna Rao 2006).

Agriculture can be an important engine of growth and poverty reduction. But the sector is underperforming in many countries in part because women who are often a crucial resource in agriculture and the rural economy face constraints that reduce their productivity (Mehta et al 2012). They make essential contribution to the agricultural and rural economies in all developing countries. Their roles vary considerably between and within regions and are changing rapidly in many parts of the world where economic and social forces are transforming the agricultural sector. Rural women often manage complex households and pursue multiple livelihood strategies. Their activities typically include producing agricultural crops tending animals, processing and preparing food, working for wages in agricultural or other rural enterprises, collecting fuel and water, engaging in trade and marketing, caring for family members and maintaining their homes. Agricultural sector in many developing countries is underperforming because women who represent a crucial resource in agriculture and the rural economy through their roles as farmers, laborers and entrepreneurs almost everywhere face more severe constraints than men in access to productive resources.

Women are involved in each and every activity of chilli production system starting from sowing to nursery bed making, nursery raising, transplanting, weeding, top dressing of fertilizer, harvesting, drying, grading, chilli powder making, packing and marketing. For all these activities women experience drudgery among themselves.

The drudgery of women's work is still major problem. The nature of women's manual labour in agriculture has changed very little since age in almost all countries where agriculture is the primary occupation of a large population. About 78 per cent of economically active women are engaged in agriculture compared to 63 per cent of the male population. About 50 per cent of rural women are classified as agricultural laborers and 37 per cent as cultivators (Anon 2011). Women are slowly taking up agriculture as their occupation due to the migration of men for better employment opportunities in nearby cities.

The study was conducted at Dharwad to assess the drudgery reducing tool, harvest bag (cot bag) while chilli harvesting by the farm women and to know the physical load and postural discomfort while performing the activities.

METHODOLOGY

The present study was planned based on the major crops grown and the

participation of women in various agricultural activities. For chilli production system, chilli growing villages namely Shivalli, Shirguppi, Kundgol, Mantoor and Noolvi were selected. The total sample comprised 150 farm women for the characterization of drudgery of women in the selected production environment from the selected villages.

The secondary information about the operational villages was collected through Gram Panchayats and agricultural department. The general information on gender participation in various activities and technology usage was collected through focus group discussion in the selected villages. Each improved drudgery reducing agricultural technology was validated in the field to test the performance. The performance evaluation comprised parameters viz pace of work, human power used, work done/unit time, drudgery score, disorder score, labour needed and labour wages. The drudgery scores were given for analyzing the drudgery experience using both conventional and improved technologies.

The questionnaire was used for detailed data collection on validation of technologies in maize, groundnut, chilli and dairy production systems through field validation method. The drudgery experienced by the women was assessed by giving the scores on six parameters as under:

Rating on work demand (scores 1-5):

Very demanding (5), demanding (4), moderate (3), less demanding (2), very less demanding (1)

Rating on feeling of exhaustion (score

1-5): Very exhausted (5), exhausted (4), moderately exhausted (3), mildly exhausted (2), no exhaustion (1)

Rating on posture assumed in work (score

1-5): Very difficult (5), difficult (4), moderately difficult (3), easy (2), very easy (1)

Rating on manual loads operatives

(score 1- 5): Very painful (5), painful (4), moderately painful (3), mild pain (2), no pain (1)

Rating on work load perception (score

1-5): Very heavy loads (5), heavy loads (4), moderately heavy loads (3), light loads (2), no loads (1)

Rating on difficulty perception (score

1-5): Very heavy (5), heavy (4), moderately heavy (3), light (2), very light (1)

The disorder scores were given by collecting the data on types of disorder symptoms on various body parts like itching, burning, numbness, swelling and pain etc. The body disorders of women were assessed on three parameters:

Body tolerance to symptoms:

Ignorable (1), bearable (2), unbearable (3)

Symptoms frequency: Never (1), very often (2), not very often (3), quite often (4), always (5)

Impact on work: No impact (1), temporarily terminated work (2), permanently discontinued (3)

RESULTS and DISCUSSION

Table 1 shows that maximum percentage of the households belonged to the forward caste category (64.00%)

followed by backward caste (19.33%), having nuclear family system (77.33%) and belonged to middle income group (42.66%) followed by 36.67 per cent belonging to low income group. Maximum percentage of households had more than 10-20 years (42%) followed by 30 per cent having 20-30 years of farming experience. Maximum percentage of the sample women belonged to the middle (46.00%) followed by young (31.33%) and old age (22.00%) groups. Agriculture was the major source of income for all the households. Other than agriculture

Table 1. Socio-economic characteristics of the respondents in chilli production system (n= 150)

Variable	Category	Frequency	Percentage
Caste	Backward caste	29	19.33
	SC	6	4.00
	ST	19	12.67
	Forward caste	96	64.00
Family type	Nuclear	116	77.33
	Joint	26	17.33
	Extended	8	5.33
Age of the respondent (years)	Young (18 - 35)	47	31.33
	Middle age (36-50)	69	46.00
	Old age (>51)	33	22.00
Land holdings	Marginal	40	26.67
	Small	59	39.33
	Medium	29	12.67
	Large	22	14.67
Type and average number of animals	Bullocks	43	28.66
	Cows	45	30.00
	Buffaloes	13	8.66
	Sheep/goat	2	1.33
# years of farming	<10	33	22.00
	10-20	63	42.00
	20-30	45	30.00
	>30	9	6.00
Total family income (Rs)	Low (<61000)	55	36.67
	Middle (61000-130000)	64	42.66
	High (>130000)	31	20.67

13.33 per cent families had other sources like petty business, Rojgar Udyog etc; 10.66 per cent had income from employment and only 7.33 per cent had dairy as another source of income as depicted in Table 2.

Table 2. Average income from various sources by the selected households in chilli production system (n= 150)

Source	Frequency	Amount (Rs)
Agriculture	150 (100)	128241
Dairy	26 (7.33)	31072.00
Service	16 (10.66)	66225.00
Others	20 (13.33)	111111.00
Average income	-	336649.00

Figure in parentheses indicate percentage values

Major crops grown and income received by the selected households of chilli production system are presented in Table 3. Chilli, maize, cotton, onion, Jawar and groundnut were the crops grown in Kharif season and Bengal gram and wheat were grown in Rabi season. The average income received from chilli alone was Rs 77626. It was grown mainly on 1-2 acres of land by 53.33 per cent farmers followed by 39.33 per cent growing on 3.5 acres of land. The average yield of chilli was observed to be 3.12 q/acre. Cotton was another crop grown by majority of the families (74.9%) followed by wheat (48.67%), Jawar (40%) and Bengal gram (34.67%).

Activity calendar of women in chilli production system is presented in Table 4. The crop was grown in Kharif season but the crop activities were spread over whole the year. The crop activity usually started in May-June with land preparation and sowing/transplanting. Inter-culturing, weeding and fertilizer application were the activities done during July-August. Topdressing of fertilizers and spraying were taken up during September-October; harvesting and drying were the major activities in November-December. These two activities continued in January-February along with drying, grading and marketing. March-April were the months during which grading storage/marketing were held.

Table 5 presents the details of gender participation and technology usage in chilli production system. Weeding (100.00%), picking (100.00%) and transplanting (99.17%) were completely women exclusive activities wherein cent per cent women participated followed by grading (90.67%). On the other hand gathering and heaping (88.66%) followed by transportation of manure (84.66) were the activities mainly done exclusively by men. Removing of stalks/cleaning was the activity wherein there was equal participation (75.33%) of both men and women.

The improved technology for harvesting of cotton ie cot bag was

Table 3. Major crop diversification among the selected households of chilli production system (n= 150)

Crop	# growers	Season	Crop area (acres)				Average yield/ acre (q)	Average income (Rs)
			1-2	3-5	5-10	>10		
Chilli	150 (100)	Kharif	80 (53.33)	59 (39.33)	6 (4.00)	5 (3.33)	3.12	77626
Bengal gram	52 (34.67)	Rabi	43 (28.67)	8 (5.33)	-	1 (0.67)	3.67	11152
Cotton	111 (74.00)	Kharif	91 (60.67)	16 (10.67)	3 (2.00)	1 (0.67)	5.57	28661
Groundnut	56 (37.33)	Kharif	38 (25.33)	17 (11.33)	-	1 (0.67)	4.78	13250
Jawar	60 (40.00)	Kharif	54 (36.00)	6 (4.00)	-	-	4.19	11822
Onion	21 (14.00)	Kharif	12 (8.00)	8 (5.33)	1 (0.67)	-	16.52	33465
Wheat	73 (48.67)	Rabi	64 (42.67)	9 (6.00)	-	-	3.84	10059
Green gram	15 (10.00)	Kharif	11 (7.33)	4 (2.67)	-	-	3.73	14742

Figures in parentheses indicate percentage values

Table 4. Crop calendar of the respondent women

	Operations done during different seasons			
	Jan-Mar	Apr-June	July-Sept	Oct-Dec
Agriculture				
Kharif	Postharvest and marketing activities	Land preparation, sowing	Sowing, inter-culturing, weeding, fertilizer application, spraying	Top dressing of fertilizer, spraying, harvesting, threshing
Rabi	-	-	Land preparation	Sowing, weeding, inter-culturing
Chilli production system				
Kharif	Jan-Feb Drying, grading, marketing	Mar-Apr Grading, storage, marketing	May-June land preparation, sowing	Sept-Oct Spraying, Harvesting, drying Nov-Dec Top dressing of fertilizer

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Table 5. Gender participation and technology usage in chilli production system (n= 150)

Activity	Frequency	Gender participation					Technology usage
		WE	WD	ME	MD	EP	
Removing of stalks/cleaning	150	29 (19.33)	8 (5.33)	-	-	113 (75.33)	Manual
Hand watering	121	-	-	66 (54.54)	28 (18.67)	27 (22.31)	Water cans
Transportation of manure	150	-	-	127 (84.66)	1 (0.67)	22 (14.66)	Baskets, spade
Topdressing of fertilizer	150	82 (54.67)	49 (32.67)	14 (9.33)	4 (2.67)	1 (0.67)	Manual
Sowing	29	-	-	18 (62.06)	3 (10.34)	8 (27.58)	Manual
Transplanting	121	120 (99.17)	1 (0.82)	-	-	-	Manual
Weeding	150	150 (100)	-	-	-	-	Khurpi
Picking	150	150 (100)	-	-	-	-	Manual
Gathering and heaping	150	-	-	133 (88.66)	17 (11.33)	-	Manual
Grading	150	136 (90.67)	14 (9.33)	-	-	-	Manual

WE= Women exclusive, WD= Women dominating, ME= Men exclusive, MD= Men dominating, EP= Equal participation

evaluated in field validation trials for its performance, drudgery experiences, disorder symptoms and its impact on various body parts (Table 6). In traditional method of chilli harvesting the farm women used plastic basket to keep the harvested chilli. This fastened the wok but in the improved method harvest bag was used to keep the harvested chilli. In this method the farm women felt it difficult to keep the harvested chilli and they also said that in improved method they had to use it in bending and standing posture. But in traditional method they worked in sitting and

bending posture which was more comfortable than improved method.

The drudgery experiences of farm women by using conventional method of harvesting of chilli and by using improved technology-harvest bag are presented in Table 7. On an average the harvest bag has shown positive and significant performance as compared to the traditional method wrt various drudgery parameters like rating on work demand, manual loads operative, difficulty perception and work load perception.

Table 6. Performance evaluation of harvest bag in comparison to traditional method while harvesting chilli in field validation trials (n= 30)

Parameter	Conventional practice	Improved practice	Change due to technology (minutes)	't' value
Pace of work (minutes)/ coverage/q	1186.71	1371.96	-185.25	6.45**
Human power used Δ	3.00	2.63	0.37	4.10**
Work done/unit time (kg/hour)	5.13	4.40	0.73	7.49**
Drudgery score (30 maximum)	20.50	19.37	1.03	2.12**
Disorder score	17.29	20.19	1.00	3.89**
Labourers needed/q	7.87	9.93	2.07	
Economic benefit	943.47	1191.73	-248.27	

Very satisfied= 5, Satisfied= 4, Fairly satisfied= 3, Dissatisfied= 2, Very dissatisfied= 1

**Significant at 1% level of significance, *Significant at 5% level of significance

Table 7. Drudgery experiences (score 1-5) compared while harvesting chilly with conventional method and improved method (cot bag) in field validation trials (n= 30)

Drudgery experience (score 1-5)	Conventional practice	Improved practice	Change due to technology	't' value
Rating on work demand	3.67	2.90	0.77	3.80**
Rating on feeling of exhaustion	3.40	3.50	-0.10	-0.72
Rating on posture assumed in work	3.40	3.33	0.07	0.63**
Rating on manual loads operatives	3.30	3.13	0.17	1.22**
Rating on difficulty perception	3.30	3.23	0.07	0.47*
Rating on work load perception	3.43	3.27	0.17	1.09**
Total score	20.50	19.37	1.13	

**Significant at 1% level of significance, *Significant at 5% level of significance

Drudgery Experiences:

Very demanding= 5, Demanding= 4, Moderate= 3, Less demanding= 2, Very less demanding= 1

Very exhausted= 5, Exhausted= 4, Moderately exhausted= 3, Mildly exhausted= 2, No exhaustion= 1

Very difficult= 5, Difficult= 4, Moderately difficult= 3, Easy= 2, Very easy= 1

Very painful= 5, Painful= 4, Moderately painful= 3, Mild pain= 2, No pain= 1

Very heavy loads= 5, Heavy loads= 4, Moderately heavy loads= 3, Light loads= 2, No loads= 1

Very heavy= 5, Heavy= 4, Moderately heavy= 3, Light= 2, Very light= 1

Significant difference was not observed in feeling of exhaustion during work.

The data on level of work related body disorders in different body parts while

harvesting chilli with conventional method and improved technology (harvest bag) are presented in Table 8. Farm women gave maximum score to pain in lower back (5.80) followed by knees (3.53) and upper back

Table 8. Level of work related body disorders while harvesting chilli with conventional and improved technology (n= 30)

Parameter	Impact of technology on body parts																	
	Traditional									Improved								
	a	b	c	d	e	f	g	h	i	a	b	c	d	e	f	g	h	i
Body tolerance to symptoms	0.27	0.27	0.06	1.67	0.93	0.13	0.27	1.00	0.53	0.27	0.17	0.06	1.77	0.53	0.93	1.00	1.00	0.80
Symptom frequency score	0.47	0.47	0.13	2.80	1.47	0.17	0.47	1.60	0.90	0.47	0.27	0.13	2.60	0.91	1.23	1.47	1.60	1.3
Impact of symptom on work	0.13	0.13	0.03	1.33	0.47	0.13	0.40	0.93	0.47	0.13	0.10	0.03	1.53	0.23	0.47	1.00	1.10	0.77
Total score	0.87	0.87	0.23	5.80	2.87	0.43	1.13	3.53	1.90	0.9	0.53	0.23	5.90	1.67	2.63	3.47	3.70	2.87

Body parts: a= Finger, b= Wrist, c= Shoulders, d= Lower back, e= Upper back, f= Hands, g= Upper legs, h= Knees, i= Lower legs
 Body tolerance to symptoms score: Ignorable= 1, Bearable= 2, Unbearable= 3
 Symptoms frequency score: Never= 1, Very often= 2, Not very often= 3, Quite often= 4, Always= 5
 Impact on work score: No impact= 1, Temporarily terminated work= 2, Permanently discontinued= 3

(2.87) while harvesting chilli using conventional method. They gave maximum scores to pain in lower back (5.90) followed by knees (3.70) and upper legs (3.47) in improved method of harvesting the chilli.

CONCLUSION

Technological empowerment of women is the need of the day for betterment of agriculture and agricultural production. This should also reduce drudgery and enhance the efficiency of women in agriculture and ultimately increase the productivity. Field validation of improved technology of harvesting the chilli had better outcome on all the parameters with significant differences. The harvest bag showed positive and significant performance as compared to the traditional method on

various drudgery parameters. Farm women felt maximum pain in lower back followed by knees and upper back while harvesting chilli using conventional method and in case of improved method felt maximum pain in lower back followed by knees and upper legs.

REFERENCES

- Anonymous 2011. The role of women in agriculture. ESA Working Paper # 11-02, Agricultural Development Economics Division, The Food and Agriculture Organization of the United Nations.
- Krishna Rao E 2006. Role of women in agriculture: a micro level study. *Journal of Global Economy* **2(2)**: 107-118.
- Mehta M, Gandhi S and Dilbaghi M 2012. Intervention of drudgery reducing technologies in agriculture and impact evaluation. *Work* **41(1)**: 5003-5008.

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