



Challenges and health impacts encountered by rural women in cotton production

MINI SHARMA*, MANJU DAHIYA, SOMVEER NIMBAL, AND S.S. YADAV

Department Extension Education and Communication Management, Haryana Agricultural University, Hisar-125004

**Email: minisharma1113@gmail.com*

Abstract : Cotton, one of the principal cash crops of India, contributes significantly to the country's economy and foreign exchange earnings. Approximately 60 million people depend on cotton production and related industries for their livelihoods and usage of pesticides in India by the cotton cultivators, cause environmental pollution and health impacts and other challenges. In addition to dust, ultraviolet light etc. farm workers and female cotton pickers are exposed to the after effects of pesticide use in cotton production. In production of cotton also women face variety of challenges. Since the extent of mechanization is limited, cotton production system is mostly labor intensive in cotton picking, weeding etc mainly. The study was designed to provide an overview of the major challenges faced by the respondents during production of cotton in Dhansu village of Hisar district, Haryana. A total of 30 respondents were selected by using random sampling technique. It was found that role of women in cotton production was mainly in labour intensive jobs like cotton picking 86.7 per cent, stalk collection 60.0 per cent, weeding 56.7 per cent, and sowing 36.7 per cent etc. The study revealed that the majority 93.3 per cent of respondents agreed with non availability of picking bag and plucker for cotton whereas 73.3 per cent of respondents agreed with unexpected rain. The cotton pickers encountered multiple health problems and had less use of precautionary measures.

Keywords: Challenges, cotton, health impacts, production, respondents

Cotton known as “White Gold,” is the primary industrial crop in major cotton-producing nations like China, India, the United States, Pakistan, Brazil, Uzbekistan, Egypt, Argentina, Australia, and Turkey, which together produces close to 85 per cent of the world's cotton. Basically, the word “cotton” is derived from the Arabic word “al-qutun,” which in turn seems to have roots in the Sanskrit word “*kapas*.” Arabs used to buy cotton from India and trade it with Europe. The cotton production is central to economic growth for many developing countries. Not only does the cotton cultivation generate income for millions of farmers, but it is also a source of livelihood for millions engaged in the entire textile value chain. In addition to contributing greatly to the gross domestic product, it also facilitates foreign exchange earnings. India is the second largest consumer of

cotton in the world and one of the world's top producers of cotton, with the most land planted to the crop. The most significant fiber in the world, cotton makes up 40 per cent of all fiber production world wide. A Report on cotton sector (2022) reported that cotton production plays a major role in sustaining the livelihood of an estimated 6 million cotton farmers and 40-50 million people engaged in related activity such as cotton processing and trade. But, improper harvesting or incorrect post-harvesting storage can decrease the value of the cotton, making it unusable or unsuitable for dyeing. However, farmers involved in cotton production face several challenges such as climate change, pest and disease management, soil health and fertility, access to resources, market volatility and price fluctuations that can significantly impact their livelihoods. Agriculture is an

important unorganized sector when majority of the women labour force is engaged. The majority of work performed by farm women was in cutting, picking, cleaning, drying, storing, and processing of cotton. In cotton cultivation, women handle the majority of the labor intensive duties. Revanwar *et al.*, (2015) stated that cotton picking activity was a women exclusive activity which was ranked first for its drudgery load. Drudgery load of cotton picking activity was highest mainly due to repetitive strain and time load factors. Drudgery load of cotton picking activity was also found to be increased due to physical load factor, as they carried 5-10 kg weight of cotton while performing cotton picking.

All manual chores take a lot of drudgery, time, and energy expenditure, which poses a number of health risks. In addition, a rising issue is the lack of personnel during the peak crop season because mechanization has traditionally been seen as the purview of men alone, the burden of all these labor intensive agricultural operations is eventually placed on the shoulders of women farmers. Women workers in majority are preferred as workers in commercial agriculture like tea, coffee, sugarcane, cotton, tobacco and plantation products (Singh *et al.*, 2007).

Garcia (2003) stated that cotton pickers rarely covered their mouth and nose during picking resulting in respiratory track problems. Sometimes, while picking cotton or afterward, female cotton pickers experienced gastrointestinal issues, as well as weakness and exhaustion, skin burning, and eye discomfort Ruma *et al.*, (2004). Therefore, the study was planned with an objective to characterize challenges and health hazards encountered by rural women in cotton production by the factor which was most associated with it.

The study was conducted in rural area of Hisar district. One village was selected randomly in the sample for research. Total thirty respondents from Dhansu village of Hisar district were selected randomly. Interview schedule was

developed and data were collected personally, Frequency and percentage were used for interpretation and analysis of data.

The data in Table 1. described the personal profile of the respondents in percentage distribution according to age, caste, family type and family size.

Age: Distribution of the respondents according to their age showed that majority of the respondents 53.3 per cent belonged to the age group of 20-39 years of age whereas 46.7 per cent belonged to the age group of 40-59 years.

Family type: Data indicates that majority 73.3 per cent of the respondent's belonged to joint families while 26.7 per cent of the respondents belonged to nuclear family.

Education: It was corroborated from the data that 63.3 per cent respondents were up to primary educated followed by 23.3 per cent were educated up to secondary whereas 13.3 per cent were illiterate.

Occupation: Cent per cent of the respondents had farming as their main occupation.

Land holding: Majority of the respondents 76.7 per cent had land holding between 1-2 hectare and 23.3 per cent had land holding between 2.00- 4.00 hectare.

Cropping pattern: Majority of the respondents 50 per cent had monoculture pattern whereas 50 per cent of respondents had crop rotation with (bajra/Guar/moong) pattern.

Varieties grown: Majority of the respondents 66.7 per cent grow *Bt* cotton and rest 33.3 per cent of the respondents grow *desi* cotton.

Table 2. revealed about the mass media exposure that majority of the respondents 53.3 per cent had low mass media utilization which was followed by 36.7 per cent had medium utilization and only 10 per cent had high utilization. Similar study supported by Sharma *et al.*, (2022) that majority of the respondents 55.83 per cent had low mass media utilization.

Table 1: Socio demographic profile of the respondents n=30

Sr. No.	Variables and categories	Frequency	Percentage%
1.	Age (Years)		
	20 – 39	16	53.3
	40– 59 years	14	46.7
	Above 60	-	
2.	Family type		
	Nuclear family	8	26.7
	Joint family	22	73.3
3.	Educational status		
	Illiterate	4	13.3
	Primary Education	19	63.3
	Secondary Education	7	23.3
4.	Occupation		
	Farming	30	100.0
5.	Land holding (Actual)		
	Small 1 – 2 hectare	23	76.7
	Medium 2- 4 hectare	7	23.3
	Large >4 hectare	-	-
6.	Cropping pattern		
	Monoculture	15	50.0
	Crop rotation with (bajra/Guar/moong)	15	50.0
7.	Varieties grown		
	<i>Bt</i> Cotton	20	66.7
	Desi cotton	10	33.3
8.	Natural calamities faced during last three year		
	Extreme Temperature	13	43.3
	Un-timely Rainfall	16	53.3
9.	Sources of irrigation		
	Canal	10	33.3
	Tube well	20	66.7
10.	Training availability of picking bag for cotton		
	Yes	-	-
	No	30	100.0

Data regarding media usage indicated that 70 per cent respondents had medium level media usage of digital technology followed by 16.7 per cent had low usage and 13.3 per cent of respondents had high level usage of digital technology (Whats app, Face book, YouTube in the form of watching movies, shopping and sharing messages). The findings were also supported by Jat *et al.*, (2021) who revealed that majority of farmers 59.70 per cent were in

medium group of ICT use followed by low and high group.

Table 3. elucidated labour use pattern in cotton production between males and females. The table indicated that cent per cent of males were involved in marketing of cotton and preparation of land followed by 80 per cent of males and 20 per cent of females were involved in irrigation, 73.3 per cent of males and 26.7 per cent of female were responsible for plant

protection (spray), 70 per cent of males and 30 per cent of females in manure application, 63.3 per cent of males and 36.7 per cent of females were involved in sowing of cotton, 43.3 per cent of males and 56.7 per cent of females were involved in weeding and inter-culturing, 40 per cent of males and 60 per cent of females were responsible for stalk collection whereas only 13.3 per cent males and 86.7 were involved in harvesting of cotton crop. Similar results were supported by Yadav *et al.*, (2016) who indicated that 27 per cent respondents employed 1-3 (hours) female labourers in weeding activities, followed by picking 24 per cent and stalk collection respectively. While 4-6 (hours) female labourers were employed in picking 30 per cent and plant harvesting 15 per cent.

Table 4. revealed about the health impacts on women in cotton pickers. Although women are not involved in pesticide spraying, they are exposed to residual effects of pesticide in addition to dust, ultraviolet radiation, long

working hours, dehydration etc. during cotton picking. The data revealed that majority of the respondents 90 faced the problem of headache followed by 73.3 per cent of the respondents suffered elbows stiffness whereas 70 per cent skin problems/dermal absorption, 63.3 per cent of the respondents suffered with cough/flu, 60 per cent with wrist ache, 36.7 per cent with dryness of throat, 30 per cent with eye irritation, 26.7 per cent with pesticide inhalation/shortness of breathing, 23.3 per cent with lower backache and rest 10 per cent of the respondents suffered sleeplessness. Similar results were supported by Yadav *et al.*, (2016) who indicated that under the category of aches in body parts majority of female respondents reported upper arm (85.5%), wrist (84.5%), shoulder pain (79.5%), thigh pain (79.5%), backache (78.0%), neck (75.0%), headache (73.0%), stomach (47.5%), respectively.

Khwaja (2001) argued that female cotton pickers are more exposed to pesticide use during

Table 2: Communication profile of the respondent

n=30

Information Source Utilization	Frequency N=30	Percentage
a) Mass media exposure*		
Low (5 - 7)	16	53.3
Medium (8 - 10)	11	36.7
High(11 - 13)	3	10.0
b) Usage of digital technology**		
Low (4 - 6)	5	16.7
Medium (7 - 9)	21	70.0
High (10 - 12)	4	13.3

*Mass Media exposure (Radio, TV viewing, Films, News paper, Leaflets/pamphlets/handouts)

**Usage of Digital technology (Whats App, Face book, YouTube, Telegram)

Table 3: Labour use pattern in cotton production

n=30

S. No.	Activities	Male	(%)	Female	(%)
1.	Land preparation	30	100.0	-	-
2.	Sowing	19	63.3	11	36.7
3.	Weeding and inter-culturing	13	43.3	17	56.7
4.	Manure application	21	70.0	9	30.0
5.	Plant protection (spray)	22	73.0	8	26.7
6.	Irrigation	24	80.0	6	20.0
7.	Harvesting (picking)	4	13.3	26	86.7
8.	Stalk collection	12	40.0	18	60.0
9.	Marketing	30	100.0	-	-

Table 4: Health impacts on women cotton pickers

n=30

S. No.	Health impacts	Frequency	Percentage
1.	Pesticide inhalation/shortness of breathing	8	26.7
2.	Skin problems/ dermal absorption	21	70.0
3.	Headache due to ultraviolet radiation	27	90.0
4.	Cough/Flue	19	63.3
5.	Eye irritation	9	30.0
6.	Dryness of throat/dehydration	11	36.7
7.	Sleeplessness	13	10.0
8.	Lower backache	7	23.3
9.	Wrist ache/shoulder ache	18	60.0
10.	Elbows stiffness	22	73.3

Multiple responses*

Table 5: Challenges faced by the respondents in Cotton Production

n=30

S. No.	Statements	Agree	Somewhat Agree	Disagree	TMS	WMS	Rank
1	High cost of seeds	21(70.0)	5(16.7)	4(13.3)	77.0	2.56	III
2	High cost of pesticides	19 (63.3)	3(10.0)	8(26.7)	68.0	2.26	VI
3	High cost of labour wages	12(40.0)	13(43.3)	5(16.7)	67.0	2.23	VII
4	Less MSP	17(56.7)	13(43.3)	-	77.0	2.56	III
5	Low rate of returns	13(43.3)	11(36.7)	6(20.0)	67.0	2.23	VII
6	Water shortages	17(56.7)	13(43.3)	-	77.0	2.56	III
7	Unexpected rain	22(73.3)	8(26.7)	-	82.0	2.73	II
8	Outbreak of pest and disease and its management	16(53.3)	12(40.0)	2(6.7)	74.0	2.46	V
9	Difficulty in access to finance and credit	14(46.7)	10(33.3)	6(20.0)	68.0	2.26	VI
10	Non availability of picking bag and plucker for cotton	28(93.3)	-	2(6.7)	86.0	2.86	I
11.	Delayed cash payment	18(60.0)	10(33.3)	2(6.7)	76.0	2.53	IV

cotton picking as they work from morning till sun dust. Female cotton pickers are also exposed to pesticide in the form of inhaling polluted environment when the adjacent fields are sprayed.

Data about challenges faced by the respondents in cotton production has been furnished in Table 5. It is evident that regarding the challenges faced, respondents gave (Rank=1, WMS =2.86) to non availability of picking bag and plucker for cotton. In contradiction, if cotton bag is available, then it can reduce the drudgery of farm women which is also stated by Dhillon *et al.*,

(2007) purposively selected 60 female respondents who were intensively involved in cotton-picking activity in Bathinda district of Punjab state. Field experiments were conducted to compare the ergonomic cost in terms of physiological responses between conventional and improved techniques of cotton picking (improved bag and plucker). Results of the study exhibited significant reduction in Heart Rate (7.29%), Energy Expenditure (17.30%), Total Cardiac Cost of Work (43.75%) and Physiological Cost of Work (43.76%) with the use of improved methods. Women adopted improved bag and

Table 6: Precautionary measures used by the cotton picker

n=30

S. No.	Precautionary measures	Agree	(%)
1.	No use of any measure	18	60.0
2.	Cotton picking bag	2	6.7
3.	Gloves	4	13.3
4.	Scarf/Handkerchief	21	70.0
5.	Delaying picking	6	20.0
6.	Wearing shoes, socks etc	15	50.0

Multiple responses*

plucker and as users, they were satisfied and relieved of their drudgery. On the other hand (Rank=2, WMS=2.73) was given by respondents for unexpected rain whereas (Rank=3, WMS=2.56) to high cost of seeds, less MSP and water shortages. Similar results were supported by Yadav *et al.*, (2013) who indicated that high cost of seeds was most serious constraint and it was ranked first with weighted mean score of 2.78. On the other hand, respondents gave (Rank=4, WMS=2.53) to delayed cash payment, (Rank=5, WMS=2.46) gave to outbreak of pest & disease and its management, (Rank=6, WMS=2.26) high cost of pesticides and to difficulty in access to finance and credit, (Rank=7, WMS=2.23) to high cost of labour wages and low rate of returns.

Mondal and Sinha (2015) reported that the problems faced by the cotton growers were endemic to pest and diseases, soil problems, effect of insecticides, heavy rainfall, labour problems, black marketing and private traders. Similar findings were reported by Maraddi *et al.*, (2004), Reddy *et al.*, (2010), Kumar *et al.*, (2012) and Singh *et al.*, (2013).

The study also focused on the precautionary measures used by cotton pickers. It was found that 70 per cent of cotton picker were using scarf/handkerchief in the form of *duppatta* on their heads to protect from sun followed by no use of any measure 60 per cent, wearing shoes, socks 50 per cent, gloves 13.3 per cent, delaying picking of cotton by 20 per cent and rest 6.7 per cent were using cotton picking bag as precautionary measures.

The reason being that *Bt* cotton involves less use of pesticides and other chemicals so few residual effects were observed as compared to *desi* cotton. Also there was absorption of pesticides and other chemicals in protective measure which needs to be replaced or properly washed before using again otherwise becomes worse than not wearing any protective measures. However more could be explored in details. The

results are at par with Khan *et al.*, (2015) who indicated that most farmers 52.0 per cent agreed that the risk from pesticide use is low while other considers no risk from exposure to pesticide. Gupta (2015) also reported that however the effects of exposure are not visible in short run and workers have to bear huge cumulative effects in the long run.

CONCLUSION

Although India is the second top cotton producer of the world, with appropriate environmental and social laws, in terms of productivity, it is still far behind. Our farmers are facing various constraints with regard to climatic conditions such as unexpected rain, high rate of seeds and fertilizers, heavy rainfall. The study has revealed that majority 93.3 per cent of respondents agreed with non availability of picking bag and plucker for cotton followed by 73.3 per cent of respondents suffered with unexpected rain whereas 70.0 per cent of respondents agreed with high cost of seeds. However, the conventional methods of cotton production have been associated with numerous environmental and social challenges. In order to sustain the optimum production and the productivity of the land, scientific and indigenous methods should work in harmony, and policy involvement is crucial for the well being of the farmers and also women could be encouraged to be involved in more operations in cotton production.

REFERENCES

- Dhillon, N. and Sidhu, P., 2007.** Physiological responses during cotton picking activity performed by rural women of bathinda district. Comparison of conventional and improved methods. Women at work. *Allied publishers private limited. HWWE. Bhopal.* **2:**28-33.

- Knowledge, Attitude and Adoption of farmers** towards Commercialization of Agriculture. I.C. college of Home Sciences. Chaudhary Charan Singh Haryana Agricultural University, Hisar.
- Garcia, A. 2003.** Pesticide exposure and women health. *Am. J. Ind. Med.* **44**: 584-94.
- Geeta, 2010.** Feasibility of fruit plant nursery as an enterprise for rural women. *M.Sc Thesis*, CCS Haryana Agricultural University, Hisar
- Gupta, P.K. 2004.** Pesticide exposure- *Indian Sci. Toxicol.*, **198**: 83-90.
- Anonymous International Symposium** on “Strategies for Sustainable Cotton Production” A Global Vision, Univ. Agric. Sci. Dharwad, Karnataka, India.
- Jat, J.R., Punjabi, N.K. and Bhinda, R. 2021.** Use of ICTs by tribal farmers for obtaining agricultural information in Southern Rajasthan. *Indian J. Ext. Edu.*, **57**: 16-19.
- Khan, M., Mahmood, H.Z. and Damalas, C.A. 2015.** Pesticide use and risk perceptions among farmers in the cotton belt of Punjab, Pakistan. *Crop Protection.* **67** : 184-90
- Maraddi, G.N., Hirevenkanagoudar, L.V., Verma, N.S. and Halakeri, A.V. 2004.** The constraints in the adoption of cotton production technologies in Malaprabha command area of Karnataka.
- Mondal, D. and Sinha, S.K. 2015.** Comparative analysis of the problems faced by the cotton growers in Gujarat. *J. Cotton Res. Dev.* **29** : 167-71
- Khwaja, M.A.** Impact of pesticide on environment and health. *SDPI Research Bull.* 2001. **8**:2. Islamabad
- Ruma, Y., M.A. Cheema and S. Anwar 2004.** Effects of pesticide application on the health of rural women involved in cotton picking. *Intern. J. Agric. Biol.* **6** : 220-21.
- Report on Cotton Sector 2022.** <https://texmin.nic.in/sites/default/files/Cotton%20Sector.pdf>
- Rani, S., 2016.** Empowerment of women through media package on vegetable cultivation in Haryana. *Ph.D. Thesis*, CCS Haryana Agricultural University, Hisar
- Reddy, V.R., H.F. Hodges, W.H. McCarty, and J.M. McKinnon. 1996.** Weather and cotton growth: *Present and Future*. Mississippi Agr. and Forestry Exp. Sta., Mississippi State University, Starkeville, Miss.
- Reddy, K.G., Reddy, M.C., Reddy, D.V. and Kumar, S.R. 2010.** Social Dynamics of cotton farmers in distress areas: A case of Andhra Pradesh. *J. Cotton Res. Dev.* **24** : 270-74.
- Revanwar, M.S., Zend, J.P. and Admankar. S.N. 2015.** Assessment of Drudgery of Farm Women in the Cotton Production System, *Internat. J. Innov. Res. Dev.* **4**: ISSN 2278 – 81.
- Shiv Kumar, C.L. 2007.** An Economic Analysis of Production & Marketing of Bt Cotton in Haryana and Karnataka. *M.Sc. Thesis* CCS Haryana Agricultural University, Hisar, Haryana.

- Singh, S., Kingra, H.S. and Singh, R. 2013.** Input Utilization and constraints of cotton production in Punjab. *J. Cotton Res. Dev.* **27**: 144-48.
- Sahay, A. 2019,** Cotton Plantations in India: *The Environ. Soc. Chall. Yuridika.* **34**: 429-42.
- Singh, G. and Majumdar N. 2007.** *Women friendly Improved Farm Tools and Equipment.* Bhopal Central Institute of Agricultural Engineering, Bhopal.
- Sharma, T., Kathpalia, J. and Kumari, V. 2021,** Constraints in adoption of growing *Bt.* Cotton among *Bt.* growers in Haryana. *The J. Rural Agricul. Res.* **21**:57-60.
- Textile Fashion Study 2013,** 'Cotton Cultivation: Top Cotton Producing Countries of the World' (*Textile Fashion Study*) accessed 26 March 2018.
- Yadav, S., Godara, A.K., Nain, M.S. and Singh, R. 2018.** Perceived Constraints in Production of *Bt* cotton by the Growers in Haryana. *J. Comm. Mobiliz. Sust. Dev.* Vol. **13**: 133-36.
- Yadav., M., 2013.** Media standardization for fruits and vegetables processing and preservation. *Ph.D. Thesis*, CCSHAU, Hisar.
- Yadav, R.D., and Goel, R. 2016.** Acceptability of technical knowledge on cotton cultivation through media in Haryana. *Ph.D. Thesis*, CCSHAU, Hisar.
-

Received for publication : May 30, 2023

Accepted for publication : June 10, 2023