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Health Problems and Labour use Pattern in Cotton Production: A Rural Women study

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Abstract : Cotton production is a key component of the global textile industry, involving the cultivation, harvesting, and processing of cotton plants to produce fibers used in textiles and apparel. Grown in warm climates, cotton farming supports millions of livelihoods worldwide, particularly in developing regions. However, the production process poses significant challenges, including health risks from exposure to pesticides and chemicals, labor intensive work conditions, and environmental impacts such as high water usage and soil degradation. The study was designed to provide an overview of the major challenges faced by the respondents during production of cotton in Mandhana village of Bhiwani 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, weeding 70.0 per cent, 63.3 per cent sowing and 36.7 per cent stalk collection etc. The study revealed that the majority cent per cent of respondents agreed with non-availability of picking bag and plucker for cotton whereas 73.3 per cent of respondents agreed with outbreak of pest & disease and its management and high cost of pesticides. Cotton pickers often experienced a range of health problems. These included respiratory issues due to inhaling of cotton dust, skin pesticides problems from prolonged exposure to the sun, musculoskel, problems from repetitive motions and physical exertion and heat-related illnesses from working long hours in hot conditions. Cotton pickers often had minimal or no access to protective gear such as gloves, masks or appropriate clothing. This lack of protection left them vulnerable to injuries and health hazards.

Key words: Challenges, cotton, cotton picking, health problems, production.

Cotton is a significant fiber crop in both India and globally. According to the FAO (2021), it is an essential commodity, representing 81 per cent of the world's natural fiber production, with over 24 million tons produced in 2021 (Textile Exchange, 2022). The cotton sector plays a crucial role in the economies of many developing countries, offering jobs and livelihoods to millions of rural smallholders. India is one of the top two cotton producers globally, holding a 21.5 per cent share of the market with a production of 15.0 million tons of seed cotton in 2022 followed by China, which has a 26.0 per cent share with 18.1 million tons. India leads in terms of the area harvested, covering 12.4 million hectares, which is 39.4 per cent of the total cotton area worldwide (FAO, 2023).

Our farmers encounter numerous challenges related to climate during cotton production which includes unexpected rainfall and pest or disease outbreaks. They also face issues with seeds, such as adulteration, high costs, and unavailability. Additionally, the high costs of fertilizers, pesticides, and labor, coupled with low Minimum Support Prices (MSP) and low returns, are significant concerns reported by the farmers (Yadav and Goel, 2019). In cotton cultivation, bollworms are responsible for substantial yield losses, necessitating extensive pesticide use. Nearly 54 per cent of all pesticides are applied to cotton, with about 60 per cent specifically targeting bollworm control (Prathyusha *et al.*, 2015). The indiscriminate use of pesticides has negatively impacted both pest

control and farmers' profits. In light of these challenges, *Bt* cotton has become an appealing option for cotton farmers (Singh and Kaushik 2007).

Women in the past were intensively involved in all the farm operations. In agrarian economies, women are associated with various kinds of agricultural activities and they make important contributions in production of crops. Major tasks of women farmers include hoeing, harvesting crops, preserving grains, cotton picking, and preserving and cleaning seeds (Yasin *et al.*, 2020). Cotton picking is particularly performed by women. Rural women play a significant role in cotton picking because this is exclusively female activity and 89 per cent women are engaged in it (Zarimedia, 2013). The main cotton production activities performed by women are picking, sowing, weeding, manuring and application of fertilizers. Men dominated in majority of the farm related decisions (Narala and Rani, 2021). Mostly they are illiterate and completely depend on wages and earnings from cotton picking activity (Abbas *et al.*, 2015). Cotton picking season starts from Mid-August and lasts in late November due to multiple pickings of cotton. So, women cotton pickers remain in the field from 6 to 8 h daily for more than 75 days. Females involved in this activity from all age groups and most of them belonging to landless households, who are generally the poorest population (Sayeed, 2003). During this period, they are highly influenced by pesticide exposure while inhaling in poisoned environment and having direct physical contact with the plants (Khwaja 2001; Tariq *et al.*, 2007). Due to pesticide exposure, women cotton pickers suffer different kinds of diseases, such as skin problems, dizziness, nausea, headache, fever, and stomach pain (Memon *et al.*, 2017; Bakhsh *et al.*, 2016; Tariq *et al.*, 2019).

Ahsan Abdullah (2010) found in their study that the majority of respondents (28.3%) reported negative consequences associated with *Bt* cotton, such as poor performance in rainfed conditions, the emergence of new pests and diseases like mealy bugs, tobacco streak virus, cucumber mosaic virus, grey mildew, and wilt (25.8%). Additionally, *Bt* cotton required more sprays for managing sucking pests compared to non-*Bt* cotton (23.3%), led to micronutrient deficiencies (22.5%), caused health issues among humans, including irritation while picking and allergies (28.3%), resulted in yield reduction (22.5%) and exhausted the soil, negatively affecting subsequent crops (24.2%). 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 Bhiwani district. One village was selected randomly for research. Total thirty rural women from Mandhana village of Bhiwani district were selected randomly. Interview schedule was developed and data were collected personally, frequency and percentage were used for interpretation and analysis of data.

Table 1. 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 land preparation followed by 86.7 per cent of males and 13.3 per cent of females were involved in irrigation, 80.0 per cent of males and 20 per cent of females in manure application, 70 per cent of males and 30 per cent of female were responsible for plant protection (spray), 63.3 per cent of males and 36.7 per cent of females were involved in sowing of cotton, 36.7 per cent of males and 63.3 per cent of females were involved in stalk collection, 30 per cent of males and 70 per cent of females were responsible for weeding and inter-culturing whereas only 13.3 per cent males and 86.7 were involved in harvesting of cotton crop. Similar results were supported by Rathore and Singh *et al.*, (2015) who expressed that sowing, weeding and harvesting of cotton were women

dominated activities in cotton cultivation. Cotton sowing is very tedious and requires constant bending of nearly 32 times a minute.

According to Rani, S. Usha (2013), farm women are consistently engaged in main field operations such as seed treatment, thinning, gap filling, weeding, earthing up and top dressing. Women contributed significantly to the workload during peak periods, particularly in sowing, weeding and harvesting.

Table 2. revealed about the health problems encountered by 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 93.3 faced the problem of headache followed by 83.3 per cent of the respondents suffered elbows stiffness whereas 66.7 per cent had wrist ache/shoulder ache/grip stress, 63.3 per cent had lower backache, 56.7 per cent had skin problems/ dermal absorption, 53.3 per cent of the respondents suffered with dryness of throat/dehydration, 46.7 per cent with stomach problems, 40 per cent with eye irritation & tiredness/fatigue and 36.7 per cent with pesticide inhalation/shortness of breathing. Similar results were supported by Munde and Zend (2019) concluded that maximum musculoskeletal problems of female workers while performing cotton picking activity with conventional method were very severe pain in case of lower back, knee, ankles and feet, arm and leg muscles because of many postural changes and repetitive hand movements while performing cotton picking activity continuously for 8 hrs per day during the season.

Abbas *et al.*, (2015) reported that women who pick cotton faced health problem, tiredness (54.5%), mental disturbance (9.90%) and fatigue (8.00%). Jamali (2009) reported that rural women of Pakistan have to face many problems during their agriculture related activities. They suffer from blisters, skin rashes caused by chemical sprays on cotton. Ruma *et al.*, (2004) found that female cotton pickers felt stomach problems sometimes during or after picking cotton and also felt weakness and tiredness and also are faced by skin burning and eye irritation.

Data about challenges faced by the respondents in cotton production has been furnished in Table 3. It is evident that regarding the challenges faced, respondents gave (Rank=1, WMS = 3.0) to non-availability of picking bag and plucker for cotton. In contradiction, reported that by introducing the improved method (cot bag) grip fatigue was decreased upto 6.7 per cent. Regarding musculoskel *et al.*, discomfort, women reported less pain in the upper back, shoulder joints (47.9% each) and thighs (47.3%). Hence, cot bag was found better than the existing bag as it increased the efficiency of the women and decreased the drudgery by lowering her stress, thus, making it a user-friendly bag. On the other hand (Rank=2, WMS=2.73) was given by respondents for outbreak of pest & disease and its management whereas (Rank=3, WMS=2.63) to unexpected rain, (Rank=4, WMS=2.60) gave to high cost of pesticides, (Rank=5, WMS=2.53) gave low rate of returns, (Rank=6, WMS=2.46) to difficulty in access to finance and credit, (Rank=7, WMS=2.43) to water shortages, (Rank=8, WMS=2.40) to high cost of labour wages, (Rank=9, WMS=2.33) to less MSP & high cost of seeds and (Rank=10, WMS=2.12) to delay in cash payment.

Mohanasundaram (2015) reported that the problems faced by the cotton growers were inadequate water supply followed by low quality of fertilizers and, labour shortage, high cost of inputs, high wage rate, climate condition, lack of financial facility, severity of diseases, lack of technology, poor seeds. Similar findings were reported by Maraddi *et al.*, (2004), Reddy *et al.*, (2010), Shashikant *et al.*, (2011), Singh *et al.*, (2013) and Sahay (2019).

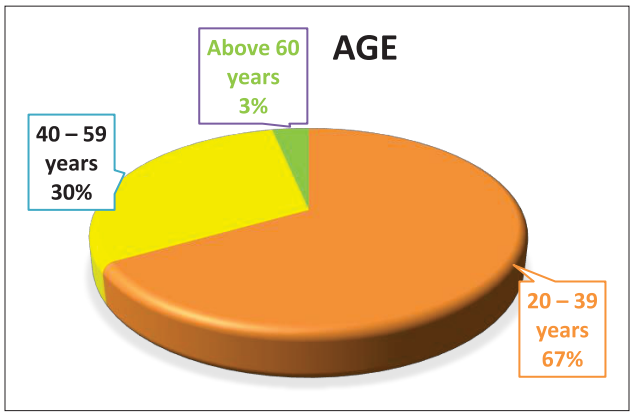

Fig. 1. Age of the respondents

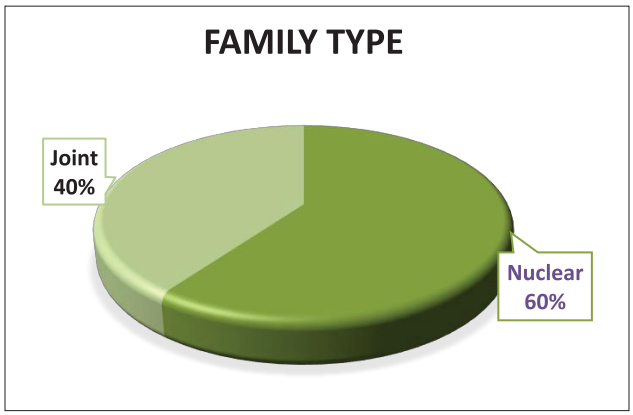

Fig. 2. Family type of the respondents

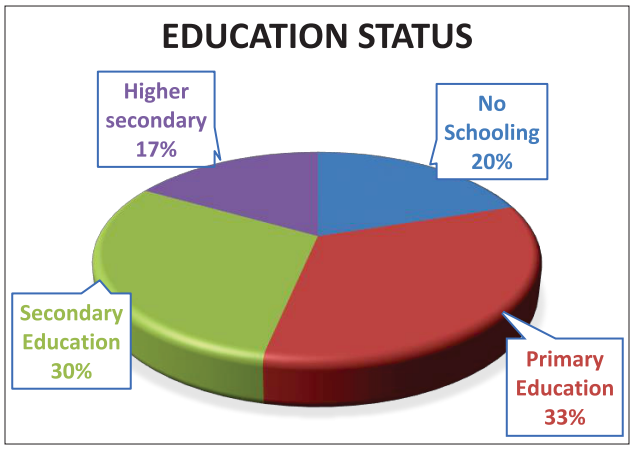

Fig. 3. Education status

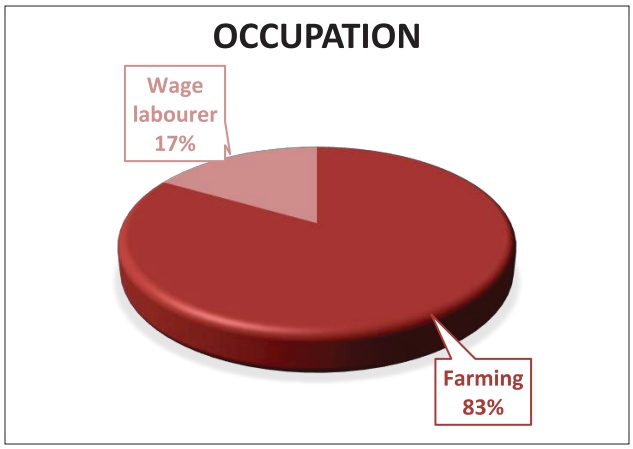

Fig. 4. Occupation

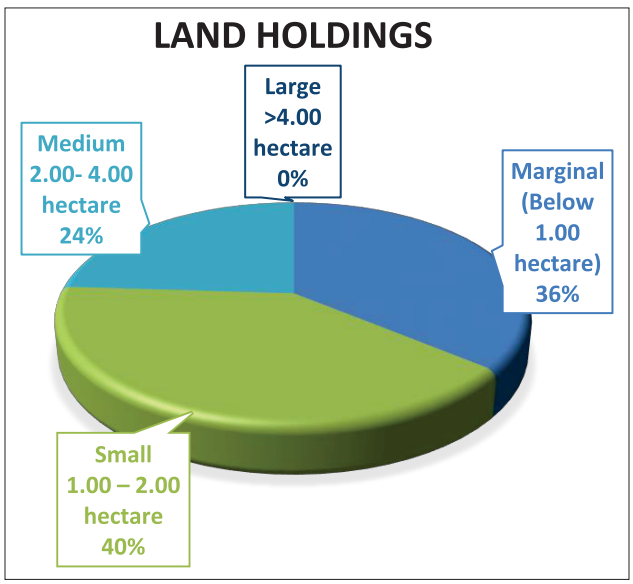

Fig. 5. Land holdings

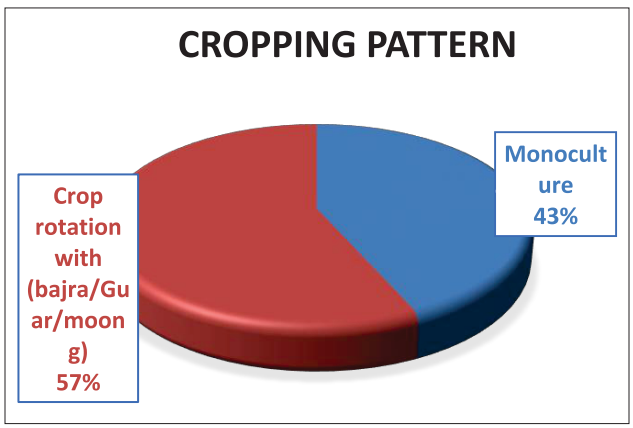

Fig. 6. Cropping pattern

The study also focused on the precautionary measures used by cotton pickers. Data from Table 4 found that 83.3 per cent of cotton picker were using scarf/handkerchief in the form of duppatta on their heads to protect from sun followed by wearing shoes, socks 60.0 per cent, no use of any measure 43.3 per cent, delaying picking of cotton by 33.3 per cent and none of them were using cotton picking bag and gloves as precautionary measures.

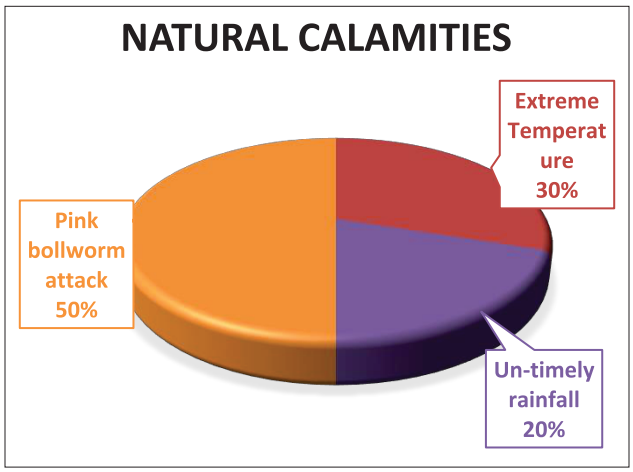

Fig. 7. Natural Calamities

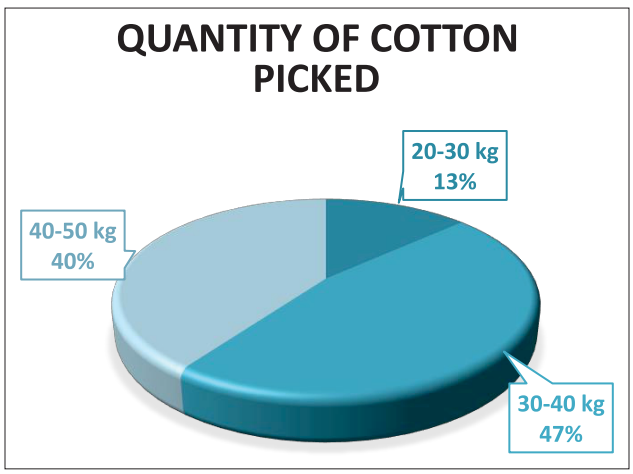

Fig. 9. Quantity of cotton picked by respondents

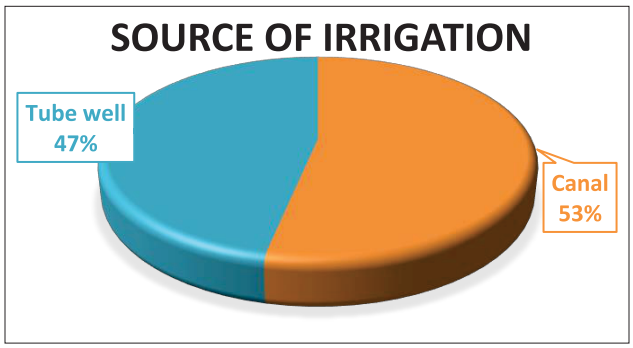

Fig. 8. Source of Irrigation

Fig. 10. Training availability of picking bag

Correlation of socio economic profile variables with dependent variables.

Table 5. showed the correlation of socio-economic profile variables with dependent variables. Natural calamities (0.456*) was found positively significant with challenges faced by respondents. It showed that as natural calamities increase, the challenges faced by the respondents will also increase. Education (0.373*) was found positively significant with labour use pattern and negatively significant with health problems of respondents (-.444). It can be concluded that as the level of education among the respondents increase, gender equality in labor use pattern will also increase and health problems among the respondents will also decrease. Cotton picking (0.304*) was found positively significant with health problems. This shows, as the quantity of the cotton picking by the respondents increase, the health problems will also increase. If they use cotton picking bags and other precautionary measures, their health problems will decrease *i.e.* physical stress, grip stress (Sabharwa *et al.*, 2016).

CONCLUSION

Although India is the world's second-largest cotton producer. Indian farmers grapple with various constraints, including unpredictable climatic conditions like unexpected rains and heavy rainfall. Additionally, the high costs of seeds and fertilizers further burden cotton producers, limiting their ability to maximize yield. The study has revealed that cent per cent of respondents agreed with non-availability of picking bag and plucker for cotton followed by 73.3 per cent of

Table 1. Labour use pattern in cotton production

n=30

S. No.	Activities	Male	Percentage	Female	Percentage
1.	Land preparation	30	100.0	-	-
2.	Sowing	19	63.3	11	36.7
3.	Weeding & inter-culturing	9	30.0	21	70.0
4.	Manure application	24	80.0	6	20.0
5.	Plant protection (spray)	21	70.0	9	30.0
6.	Irrigation	26	86.7	4	13.3
7.	Harvesting (picking)	4	13.3	26	86.7
8.	Stalk collection	11	36.7	19	63.3
9.	Marketing	30	100	-	-

Table 2. Health problems encountered by women Cotton Pickers

n=30

S. No.	Health problems	Frequency	Percentage
1.	Pesticide inhalation/shortness of breathing	11	36.7
2.	Skin problems/dermal absorption	17	56.7
3.	Headache due to ultraviolet radiation	28	93.3
4.	Stomach problems	14	46.7
5.	Eye irritation	12	40.0
6.	Dryness of throat/dehydration	16	53.3
7.	Tiredness/Fatigue	12	40.0
8.	Lower backache	19	63.3
9.	Wrist ache/shoulder ache/grip stress	20	66.7
10.	Elbows stiffness	25	83.3

Table 3. Challenges faced by the respondents in Cotton Production

n=30

S. No.	Statements	Agree (3)	Somewhat Agree (2)	Disagree (1)	TMS	WMS	Rank
1	High cost of seeds	16 (53.3)	8 (26.7)	6 (20.0)	70	2.33	IX
2	High cost of pesticides	22 (73.3)	4 (13.3)	4 (13.3)	78	2.60	IV
3	High cost of labour wages	15 (50.0)	12 (40.0)	3 (10.0)	72	2.40	VIII
4	Low rate of returns	16 (53.3)	14 (46.7)	-	76	2.53	V
5	Less MSP	14 (46.7)	12 (40.0)	4 (13.3)	70	2.33	IX
6	Water shortages	13 (43.3)	17 (56.7)	-	73	2.43	VII
7	Unexpected rain	19 (63.3)	11 (36.7)	-	79	2.63	III
8	Outbreak of pest and disease and its management	22 (73.3)	8 (26.7)	-	82	2.73	II
9	Difficulty in access to finance and credit	18 (60.0)	8 (26.7)	4 (13.3)	74	2.46	VI
10	Non availability of picking bag and plucker for cotton	30 (100)	-	-	90	3.00	I
11.	Delayed cash payment	11 (36.7)	13(43.3)	6 (20.0)	65	2.12	X

respondents suffered with outbreak of pest and disease and its management whereas 63.3 per cent unexpected rain. None of them were using cotton picking bag and gloves as precautionary measures. Awareness regarding cotton picking bags should be increase by organizing trainings. Addressing the challenges faced by Indian cotton farmers requires a multifaceted approach as dominate involved in sowing, weeding and harvesting. Combining scientific innovation with indigenous knowledge, supported by effective policies, is crucial for sustaining optimal production and land productivity. Additionally, empowering women to participate more actively in cotton production can contribute to improved outcomes for farming communities. By

Table 4. Precautionary measures used by the cotton picker

n=30

S. No.	Precautionary Measures	Agree	Percentage
1.	No use of any measure	13	43.3
2.	Cotton picking bag	-	-
3.	Gloves	-	-
4.	Scarf/handkerchief	25	83.3
5.	Delaying picking	10	33.3
6.	Wearing shoes, socks etc	18	60.0

Multiple responses*

Table 5. Correlation of socio-economic profile variables with dependent variables:

Socio-economic variables	Challenges	Labor use pattern	Health problems
Age	.191NS	-.011 NS	.235 NS
Education	.166 NS	.373*	-.444*
Land	.039 NS	-.221 NS	-.195 NS
Natural calamities	.456*	-.071 NS	.114 NS
Irrigation	.209 NS	.004 NS	.299 NS
Cotton picked	-.241 NS	.081 NS	.304*

*Significant at 5% level
NS- non-significant

embracing these strategies, India can navigate the complexities of cotton farming while promoting environmental sustain ability and social wellbeing.

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