

Assessment of drudgery level of female farm workers involved in sugarcane cultivation

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■ **ABSTRACT** : Women's participation in sugarcane cultivation shows much heterogeneity at the regional level. Evidence suggests that women are often paid less than men, for the same work. Sugarcane cultivation is tedious, tiresome and labour consuming, because agricultural workers has to stand in field and bend for hours for performing the activities. Keeping this in view, the present study was planned to assess the rate of human drudgery female farm workers, during various phases of sugarcane cultivation. Results revealed that the weeding activity require maximum time (193.65 min/day) followed by harvesting activity requiring 162.79 min/day. In trash mulching activity, agricultural workers spend their maximum time *i.e.* 170.64 min/day. During cleaning of field activity, for agricultural workers required only 159.35 min/ day. It was also observed that as compared with others, weeding was the maximum drudgery prone sugarcane cultivation activity based on drudgery index.

■ **KEY WORDS**: Drudgery, Agriculture workers, Sugarcane cultivation, Occupational hazards

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Sugarcane belongs to bamboo family of plants and is indigenous to India. It is long duration crop and requires 10 to 18 months to mature, depending on the geographical conditions. India has the largest area under sugarcane cultivation in the world. According to report of Department of Agriculture and Co-operation (2012-13), Uttar Pradesh is the leading state with regard to sugarcane production followed by Maharashtra. According to the International Labour Organization (ILO), the agricultural sector is one of the most hazardous to health worldwide. Manual and traditional farming of sugarcane is a widely accepted cultivation practice in India. The total energy requirement for cultivating sugarcane on one hectare area is 59,192 MJ (Mittal *et*

al., 2008). Sugarcane cultivation requires very high input in terms of human labour. Approximately 550 to 600 man days are needed to grow sugarcane on one hectare land.

Taneja and Gandhi (2012) conducted a vast survey at three different locations *i.e.* Coimbatore, Puducherry and Chidambaram and reported that presently a noteworthy (40 to 50 %) labour requirement is met by women labours and rest 50 to 60 per cent is met by men labours during sugarcane cultivation. In the last two decades, the availability of male agricultural workers remained stagnant at around 140 million whereas availability of female workers increased from 70 million to about 100 million (Singh *et al.*, 2015). Women's participation in sugarcane cultivation shows much

heterogeneity at the regional level. Evidence suggests that women are often paid less than men, for the same work. It has been observed that land less women work full time in fields but women of land owner's family work as unpaid, seasonal and part-time worker on their own farm. In sugarcane cultivation women perform cleaning of fields, seed selection, sett treatment, sett cutting, sett distribution, sett placement in furrows, trash mulching, gap filling, weeding, fertilizers applications, plant protection, harvesting, de-trashing, binding of cane etc. If women are actively involved in the cane cultivation activity, they will carry out these activities sincerely and timely.

It also involves enormous occupational health and safety hazards, as women workers have to perform the cane cultivation activities along with various risk factors in adverse work environment. These operations requires sustained effort, fast or force full exertion, awkward posture for lifting and lowering that involves high repetitive task. Besides this, sugarcane cultivation activities possesses several characteristics that are risky for health like exposure to the weather, close contact with animals and plants, extensive use of chemical and biological products, and use of hazardous agricultural tools and machinery. Further, Female agricultural workers involved in sugarcane production are also suffering from inconvenient working hours like prolonged working hours *i.e.* more than 12 hours/day. Therefore there is a combination of physical, psychological, psychophysical and environmental workplace problems in cane cultivation. Considering the above facts, the present investigation was planned to study the occupational health hazards and safety issues in the selected harvest and post harvest activities of sugarcane crop performed by the female labourers.

■ RESEARCH METHODS

Selection of subject and field:

The ergonomical evaluation of sugarcane cultivation was conducted with female agricultural workers in Faizabad district of Uttar Pradesh state, India. Sixty agricultural workers in the age group of 20- 45 years were selected because they usually attain their highest

strength level between 20-45 years (Mc Ardle *et al.*, 2001). The Harvest and post harvest operation was done for 07:00-AM.12:30PM. and 02:00 P.M- 5:30 PM. Field women performed the continuous transplanting operations for 50 minutes and taking 10 minutes break.

Drudgery index :

Drudgery Index (DI) was calculated on the basis of
 $X =$ Co-efficient pertaining to difficult felt.

$Y =$ Co-efficient pertaining to time spent in particular household activities.

$Z =$ Co-efficient pertaining to frequency of performance

$$\text{Drudgery index} = \frac{X + Y + Z}{3} \times 100$$

■ RESEARCH FINDINGS AND DISCUSSION

Data pertaining to performance was elicited in a four point scale *viz.*, daily (4), alternate day (3), weekly (2) and fortnightly (1). It was observed that majority of the agricultural workers *i.e.* 22.2 per cent, performed the weeding daily whereas total 10.8 per cent agricultural workers performed it on alternate days. Further, data revealed that 14.4 per cent agricultural workers performed the cleaning of fields daily and 15.6 per cent agricultural workers reported that they performed the cleaning of fields on alternate days. Total 15.6 per cent agricultural workers performed the trash mulching on daily basis. Besides this, only 14.4 per cent respondents also reported that they performed the trash mulching on alternate days.

Perusal of data on time spent revealed that in activities of agriculture the weeding activity full require maximum time (193.65 min/day) followed by Harvesting activity requiring 162.79 min/day. In Trash mulching activity, agricultural workers spend their maximum time *i.e.* 170.64 min/day. During cleaning of field activity, for agricultural workers required only 159.35 min/ day.

The perceived difficulty felt in performance of harvesting, weeding, cleaning of fields, and trash mulching activities was assessed in a five-point scale that is, very easy (1), easy (2), neutral (3), difficult (4)

Table 1 : Frequency of performance in harvesting, weeding, cleaning of fields, trash mulching

| Activities | Daily | Alternate day | Weekly | Fortnightly |
|--------------------|-----------|---------------|--------|-------------|
| Harvesting | 35 (21) | 15(9) | 8(4.8) | 2(1.2) |
| Weeding | 37 (22.2) | 18 (10.8) | 5(3) | - |
| Cleaning of fields | 24 (14.4) | 26(15.6) | 10 (6) | - |
| Trash mulching | 26 (15.6) | 24 (14.4) | 10(6) | - |

Table 2 : Time spent (minutes/day) in harvesting, weeding, cleaning of fields, trash mulching activities by agricultural workers

| Activities | Minutes/Day |
|--------------------|-------------|
| Harvesting | 162.79 |
| Weeding | 193.65 |
| Cleaning of fields | 159.35 |
| Trash mulching | 170.64 |

Table 3 : Difficulty felt in performance of harvesting, weeding, cleaning of fields, and trash mulching activities by agricultural workers

| Activities | Very easy | Easy | Neutral | Difficult | Very difficult |
|--------------------|-----------|--------|---------|-----------|----------------|
| Harvesting | 5(3) | - | - | 20(12) | 35(21) |
| Weeding | - | 10(6) | 5(3) | 15(9) | 30(18) |
| Cleaning of fields | - | 4(2.4) | - | 19(11.4) | 37(22.2) |
| Trash mulching | 8(4.8) | - | 2(1.2) | - | 50(30) |

Table 4 : Drudgery index of harvesting, weeding, cleaning of fields, and trash mulching activities by agricultural workers

| Activities | Frequency co-efficient | Difficulty co-efficient | Average time spent co-efficient | Drudgery index |
|--------------------|------------------------|-------------------------|---------------------------------|----------------|
| Harvesting | 0.56 | 0.43 | 0.65 | 54.66 |
| Weeding | 0.34 | 0.51 | 0.97 | 60.66 |
| Cleaning of fields | 0.42 | 0.32 | 0.65 | 46.33 |
| Trash mulching | 0.63 | 0.44 | 0.72 | 59.66 |

and very difficult (5). During Harvesting activity 21 per cent agriculture workers perceived the task to be very difficult whereas 12 per cent agriculture workers were found the task difficult. In the category of neutral, 3 per cent agriculture workers were involved in weeding activity. During cleaning of fields, total 22.2 per cent agriculture workers were found it to be of very difficult followed by 11.4 per cent difficult, 2.4 per cent easy. In the trash mulching activity, majority of the agriculture workers *i.e.* 30 per cent reported the activity as very difficult whereas 4.8 per cent agricultural workers reported that they found the activity very easy to perform.

Drudgery index of harvesting, weeding, cleaning of fields, and trash mulching activities was determined by calculating the time co-efficient, frequency of performance coefficient and difficulty co-efficient. Thereafter, four major drudgery prone activities performed by agricultural workers were selected on the basis of Drudgery Index (DI). It is evident that the difficulty index of weeding activity was highest (DI=60.66) and during harvesting activity the difficulty index was (DI=54.66) followed by the difficulty index of trash mulching was (DI=59.66).

Conclusion:

It was concluded that for the significant reduction

of the physiological workload and human drudgery, there is dire need to create awareness about the use of mechanized method of sugarcane cultivation, among the farmers of northern India, who are usually involved in conventional and manual method of sugarcane cultivation.

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