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# Constraints faced by farmers in adoption of agricultural mechanization for *in-situ* management of crop residue

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**Abstract**
The main aim of this study is to analyze the constraints faced by the farmers in crop residue management. The present study was conducted in two districts – Bhiwani and Kaithal, covering two blocks of each districts and two villages from each blocks with random sample techniques with 200 respondents. Results revealed that personal severe constraints faced by respondents were lack of self-confidence (17.0% and 21.0%) and lack of time (28.0% and 32.0%) was social constraint whereas poor guidance from panchayat (9.0 and 7.0%), were lack of proper marketing (25.0 and 21.0%) and lack of awareness about application process (21.0% and 14.0%) were communicational, financial and technical constraints reported in Bhiwani and Kaithal district.

**Keywords:** Agriculture**,** constraints, farmers, crop residue and management

## Introduction
Crop residue is the agricultural waste that left in the field after harvest. It is the biomass in the form of cereal straws, woody stalks, and sugarcane leaves. Crop residues used as many ways viz. biochar production, for mulching operations, animal feeding, mushroom cultivation, building materials etc. After being used in competitive alternatives such as cattle feed, animal bedding, cooking fuel, organic manure etc. nearly 234 million tonnes/year i.e. 30%) of gross residue generated in India is available as surplus and disposal of such a large amount of crop residue is a major challenge. Farmers choose burning because it's a fast and straightforward way to manage the massive quantities of crop residues and prepare the sector for subsequent crop well in time. Time available between the rice harvesting and wheat sowing is very narrow i.e. 20-30 days, and any delay in planting adversely affects the wheat crop. This coupled with combine harvesting compels the farmers to burn the residues to get rid of stubble left out after the harvest. The two states namely Punjab and Haryana alone contribute 48 percent of the total production and are subject to open field burning (Gadde *et al.* 2009) [1].
Paddy straw burning is practiced in Punjab, Haryana & Uttar Pradesh to clear the fields for Rabi Crop. The poor air quality in the NCR region, especially during winter months and the impact of crop residue burning (Paddy Straw) during October-November period every year has been a matter of grave concern. The government of India and state governments of Punjab, Haryana and Uttar Pradesh have taken a number of steps to control burning of paddy straw. Agricultural universities and KVKs had also played a major role in persuading farmers to manage paddy straw without resorting to burning. The Ministry of Farmers Welfare, Government of India, has initiated the implementation of the approved the Agricultural Mechanization Promotion Scheme with the primary objective of reducing air pollution caused by stubble burning. Thus, to control pollution, the Central Government of India was launched a special scheme, "Promotion of Agricultural Mechanization for *in-situ* Management of Crop Residue" to support the efforts of the governments of Punjab, Haryana and Uttar Pradesh and NCT of Delhi to deal with air pollution and to subsidize machinery required for *in-situ* management of crop residue. Viewing these facts, the present study was planned with specific objective to investigate the constraints faced by respondents in adoption of mechanization for crop residue management.

## Methodology
The Study was conducted in two districts – Bhiwani and Kaithal district of Haryana State, Out of each selected block one village was selected randomly covering two blocks Bawani Khera

and Bhiwani from Bhiwani district and another two blocks viz. Kaithal and Rajound from Kaithal district and two villages from each blocks Tigrana from Bhiwani block and Kheri Daulatpur from Bwani khera block and another two villages Kheri Sheru from Kaithal block and Songal from Rajound Block were selected purposively where Department of Agriculture and Farmers' Welfare has been demonstrated awareness programmes on - Promotion of agricultural mechanization for *in-situ* management of crop residue. Out of procured list 50 respondents were selected randomly from each village who were getting training from Department of Agriculture and Farmers' Welfare. Thus, a total of 200 respondents from four villages were selected for the purpose of investigation. The selected respondents were interviewed personally with the help of a well-structured interview schedule in order to get relevant information and to draw the conclusion. The collected data were classified and tabulated depending on the kind of information required keeping in view the specific objective of the study. The statistical data were analyzed by using frequency and percentage.

## Results

### Personal constraints faced by the respondents in Crop Residue Management

Table 1 depicts that in Bhiwani district personal severe constraints faced by respondents were lack of self-confidence (17.0%), lack of awareness (11.0%) and lack of interest (8.0%).

**Table 1:** Personal constraint faced by the respondents in Crop Residue Management

N - 200

| S. No. | Constraints | Extent of severity | | | | | |
|---|---|---|---|---|---|---|---|
| | | Bhiwani District | | | Kaithal District | | |
| | | Severe | Somewhat Severe | Not so Severe | Severe | Somewhat Severe | Not so Severe |
| i | Lack of awareness | 11.0 | 5.0 | 84.0 | 13.0 | 8.0 | 79.0 |
| ii | Lack of interest | 8.0 | 29.0 | 37.0 | 5.0 | 19.0 | 76.0 |
| iii | Lack of self confidence | 17.0 | 36.0 | 53.0 | 21.0 | 28.0 | 51.0 |

Figures in parenthesis indicate percentages

Similarly, in Kaithal district, 21 percent of respondents reported severe constraints of lack of self-confidence followed by lack of awareness (13.0%) and lack of interest (5.0%). The present findings are in line with Jasna (2016) [3].

### Social constraints faced by the respondents in Crop Residue Management

Table 2 revealed that social constraints faced by respondents in Bhiwani were lack of time (28.0%), lack of support from family members (20.0%) and interference of fellow farmers (16.0%). Further severe constraints reported by respondents in Kaithal were lack of time (32.0%) interference of fellow farmers (18.0%) and lack of support from family members (9.0%).

**Table 2:** Social constraints faced by respondents in Crop Residue Management

N - 200

| S. No. | Constraints | Extent of severity | | | | | |
|---|---|---|---|---|---|---|---|
| | | Bhiwani District | | | Kaithal District | | |
| | | Severe | Somewhat Severe | Not so Severe | Severe | Somewhat Severe | Not so Severe |
| i | Lack of support from family members | 20.0 | 6.0 | 74.0 | 9.0 | 17.0 | 74.0 |
| ii | Interference of fellow farmers | 16.0 | 35.0 | 49.0 | 18.0 | 28.0 | 54.0 |
| iii | Lack of time | 28.0 | 31.0 | 41.0 | 32.0 | 10.0 | 58.0 |

Figures in parenthesis indicate percentages

### Communicational constraints faced by the respondents in Crop Residue Management

Results in Table 3 revealed that communicational constraints faced by respondents in Bhiwani and Kaithal only 9.0 and 7.0 percent of respondents reported severe constraints of poor guidance from panchayat.

**Table 3:** Communicational constraints faced by the respondents in Crop Residue Management

| S. No. | Constraints | Extent of severity | | | | | |
|---|---|---|---|---|---|---|---|
| | | Bhiwani District | | | Kaithal District | | |
| | | Severe | Somewhat Severe | Not so Severe | Severe | Somewhat Severe | Not so Severe |
| i | Poor guidance from panchayat | 9.0 | 13.0 | 78.0 | 17.0 | 8.0 | 75.0 |
| ii | Lack of publicity of the scheme | - | 12.0 | 88.0 | - | 15.0 | 85.0 |
| iii | Lack of publicity of the capacity building programme | - | 18.0 | 82.0 | - | 14.0 | 86.0 |

Figures in parenthesis indicate percentages

### Financial and Production constraints faced by the respondents in Crop Residue Management

Results in Table 4 clearly envisage that financial and production constraints faced by respondents in Bhiwani 25.0 percent of respondents reported severe constraints were lack of proper marketing followed by maintenance of machinery is very costly (23.0%) and difficult to purchase all types of machines required for crop residue management (14.0%). In Kaithal 21.0 percent of respondents reported severe constraints of lack of proper marketing followed by maintenance of machinery is very costly (13.0%) and only 7.0 per cent of respondents faced difficulty to purchase all types of machines required for crop residue. Raghav and Sen (2014) [6] also revealed that majority of farmers particularly semi-medium, medium and large farm size category felt that the process of taking aid from bank is very restrictive and tedious

since a lot of paper work and daily visit to bank is needed to get the same. Results are inconsance with Herliana *et al* (2018) [2].

**Table 4:** Financial and Production constraints faced by the respondents in Crop Residue Management

N-200

| S. No. | Constraints | Extent of severity | | | | | |
|---|---|---|---|---|---|---|---|
| | | Bhiwani District | | | Kaithal District | | |
| | | Severe | Somewhat Severe | Not so Severe | Severe | Somewhat Severe | Not so Severe |
| i | Difficult to purchase all types of machines required for crop residue management | 14.0 | 33.0 | 53.0 | 7.0 | 12.0 | 81.0 |
| ii | Maintenance of machinery is very costly | 23.0 | 44.0 | 33.0 | 13.0 | 34.0 | 53.0 |
| iii | Lack of proper marketing | 25.0 | 36.0 | 39.0 | 21.0 | 28.0 | 49.0 |

Figures in parenthesis indicate percentages

**Technical constraints faced by the respondents in Crop Residue Management**

In table 5 severe technical constraints reported in Bhiwani district and Kaithal were lack of awareness about application process (21.0% and 14.0%) followed by lack of cooperation from official staff (11.0% and 13.0%). The results are in line with the result of Singh (2015) [7], Jasna (2016) [3] and Meena *et al.* (2013) [5] revealed the technical constraints faced by women dairy cooperative societies members were lack of knowledge about feeding, breeding and management practices. The non-beneficiary also perceived constraints regarding lack of knowledge about animal treatment, milk of cross bred cow having low consumer acceptability and ignorance of farmers about clean milk production.

**Table 5:** Technical constraints faced by the respondents in Crop Residue Management

N - 200

| S. No. | Constraints | Extent of severity | | | | | |
|---|---|---|---|---|---|---|---|
| | | Bhiwani District | | | Kaithal District | | |
| | | Severe | Somewhat Severe | Not so Severe | Severe | Somewhat Severe | Not so Severe |
| i | Lack of awareness about application process | 21.0 | 21.0 | 58.0 | 14.0 | 14.0 | 72.0 |
| ii | Lack of cooperation from official staff | 11.0 | 25.0 | 64.0 | 14.0 | 19.0 | 67.0 |
| iii | Difficulty in availability of machines during peak season | - | 21.0 | 79.0 | - | 11.0 | 89.0 |

Figures in parenthesis indicate percentages

## Conclusion

The study concluded that personal constraints faced by majority of respondents were lack of self-confidence, awareness and interest whereas lack of time and support from family members were social constraints. Results further revealed that poor guidance from panchayat were communicational constraints, lack of proper marketing and difficult to purchase all types of machines required for crop residue management were Financial and production constraints and lack of awareness about application process and cooperation from official staff were technical constraints faced by the respondents.

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