



Research Article

SWOT ANALYSIS OF CUSTOM HIRING CENTERS AND TRAINING NEED OF FARMERS REGARDING STUBBLE MANAGEMENT

MEENA H.R.¹, KULDEEP KUMAR², KADIAN K.S.¹, MEENA B.S.¹ AND BHANDARI G.³

¹Principal Scientist, Dairy Extension Division, ICAR-National Dairy Research Institute, Karnal, 132001, Haryana, India

²Dairy Extension Division, ICAR-National Dairy Research Institute, Karnal, 132001, Haryana, India

³Scientist, Dairy Economics, Statistics & Management Division, ICAR-National Dairy Research Institute, Karnal, 132001, Haryana, India

*Corresponding Author: Email - drhrms@gmail.com

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Abstract: A scanty of efforts have been directed to analyze the strength and weaknesses of custom Hiring centers in the study areas. There exists the need to explore the training need of farmers in mitigation of stubble burning by identifying the training need areas, society, and other agencies in organizing training on residue management. The present study was conducted in the Punjab state. Three districts namely, Ludhiana, Sangrur, Moga were selected due to the highest stubble burning cases in the last five years, from each district two-block were selected randomly. Subsequently, three villages from each block will be randomly selected. Finally, from each village, 20 respondents were selected randomly constituting of total 360 farmers. Results revealed that the major strength of CHCs was its efficiency in reducing the cost of cultivation, a major weakness of CHCs was the high initial cost in the establishment of CHCs, the major opportunity of CHCs was the interdependence of farmers in choosing the required machine, while the major threat of CHCs was the poor infrastructure available to most of the farmers in the establishment of CHCs. When the training dimension was analyzed, it was found that nearly half of the respondents require medium training for stubble management, followed by 32.77 percent of respondents that need low training for stubble management and only 20.56 percent of respondents that need high training for stubble management.

Keywords: Custom hiring center, Farmers, Machinery, SWOT analysis, Training need analysis

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Introduction

Crop stubble burning in open fields is a major pollution source during October-November each year [1]. The burning of the residue has not been only a source of atmospheric pollution, but also leads to the loss of rich renewable soil rejuvenating organic resources [2]. Over the years, attempts have been made for the improvement of linkages between agricultural research and extension services to improve the free flow of information to the farmers who are the ultimate recipient of agricultural technologies [3]. Such efforts by state and national institutions are underway to develop and extend the technologies. A study conducted by [4] was planned to gather information regarding the nature of services provided by these agencies, the costs analysis concerning the annual usage and to identify the machines that gave the best Return on Investment (ROI). In which, rotavator, laser land leveler, disc harrow, and cotton drill were found to be the most common machines among all the centers, implying that these machines were in most demand by the farmers. It was also found that the returns were maximum for the laser leveler and the cultivator due to more annual use hours, while machines like the rotavator, the tractor, which had a high return on investment, were way behind the returns generated by the laser levelers. The study also showed that all the custom hiring centers were running in profit. studied the impact of custom hiring services for costly machinery on Punjab agriculture.

Punjab is characterized by high mechanization, but the farm machinery has been mainly owned by economically sound farmers. This has led to the development of custom hiring services for farm machinery. It has helped the majority of smallholders to undertake farm operations with farm machinery without investing in it [5]. Singh (2017) [6] studied the accessibility of Farm Machinery Services to Small and Marginal Farmers. Small and semi medium tractor hiring farms earned more net income than tractor-owned farms of respective categories.

Parashunath Hiremath G. M. and Prashanth (2016) [7] reported that among the various constraints the foremost constraint faced by farmers in CHS (Custom Hiring Services) was lack of timely availability of tractor services and inadequate availability of tractor services. The second major constraint was the higher cost of CHS. Another problem regarding this service was the inadequate availability of tractor service. Most of the service providers increased the rent with the increased demand during the peak cropping seasons which resulted in a cost hike of machinery. Limited labor availability during peak season creates a need for mechanization. But the availability of an insufficient number of machines becomes a limiting factor in front of high demand. The farming operations also got delayed due to a small number of machines available which was another crucial problem faced by farmers. Some farmers of the Punjab state don't know the harmful effects of stubble burning on the environment and some farmers don't aware of the currently available stubble management practices and how to use them for managing the stubble. There is a gap that exists within the technology generation and technology dissemination and technology utilization system [8]. So, it is important to analyze the training need areas of the farmer in the mitigation of stubble burning. Singh, et al., (2013) [9] reported that the high cost of hiring a tractor was a major problem faced by most of the farmers who were availing the service. Another major constraint cited was timeliness i.e, farmers were unable to get the machinery at the time of requirement.

Materials and Methods

The present study was undertaken purposively in Punjab state due largest quantity of stubble burning cases in the North-West region of India. Punjab consists of 22 districts and is further divided into 146 development blocks.

SWOT Analysis of Custom Hiring Centers and Training Need of Farmers Regarding Stubble Management

Table-1 Strength of CHCs as perceived by respondents

Sr. No.	Statements	Strongly agree	Agree	Disagree	WMV	rank
1	Machines getting in time to the farmers	206(57.22)	108(30.00)	46(12.78)	81.33	7
2	Farmers access to various machinery increased	228(63.33)	102(28.33)	30(8.33)	85.00	5
3	Machines provided by societies are effectively working	246(68.33)	90(25.00)	24(6.67)	87.33	3
4	The appropriate procedure followed in providing services	254(70.56)	72(20.00)	34(9.44)	87.00	4
5	Rent of the machines is appropriate	200(55.56)	122(33.89)	38(10.56)	81.67	6
6	Help in reducing the cost of cultivation	262(72.78)	98(27.22)	0(0)	91.00	1
7	Improved quality of services provided by society to farmers	184(51.11)	126(35.00)	50(13.89)	79.00	8
8	Provided need-oriented services to farmers	280(77.78)	56(15.56)	24(6.67)	90.33	2

Table-2 Weakness of CHCs as perceived by the respondents

Sr. No.	Statements	Strongly agree	Agree	Disagree	mean	rank
1	High initial cost in the establishment of CHCs	312(91.67)	30(8.33)	0(0)	92.33	1
2	Shortage of skilled workers for operating machinery	176(48.89)	110(30.56)	74(20.56)	76.00	4
3	Lack of knowledge about opening process CHCs	170(47.22)	108(30.00)	82(22.78)	74.81	5
4	Fewer incentives are provided by govt. In the opening of CHCs	150(41.67)	100(27.78)	110(30.56)	70.37	6
5	lack of technical knowhow about machinery	280(77.78)	60(16.67)	20(5.56)	90.67	2
6	Not regularly taking of machine by member farmers	200(55.56)	122(33.89)	38(10.56)	81.67	3
7	Nepotism is prevailing in society	24(15.00)	96(26.67)	210(58.33)	52.22	7
8	Non-payment of fixed charges by the members for proper working	48(13.33)	94(26.11)	218(60.56)	51.29	8

Table-3 Opportunity of CHCs as perceived by the respondents

Sr.No.	Statements	Strongly agree	Agree	Disagree	Mean	rank
1	Political interference is not prevailing in Cooperatives.	224(62.22)	104(28.89)	32(8.89)	84.33	4
2	Farmer is independent in choosing the required machine	270(75.00)	60(16.67)	30(8.33)	89.00	1
3	Strong policy support for opening of CHCs	184(51.11)	130(36.11)	46(12.78)	79.33	6
4	CHCs has the potential to reduce stubble burning area	180(50.00)	152(42.22)	28(7.78)	80.67	5
5	Farmers don't need to purchase at their own cost machines	226(62.78)	106 (29.44)	28 (97.78)	85.00	3
6	CHCs Help in generating rural employment	232(64.44)	128(35.56)	0(0)	88.00	2
7	CHCs collaborate with industries for purchasing paddy residue	58(16.11)	118(32.78)	184(51.11)	55.00	8
8	Society staff provide the best advisory services to member farmers	178(49.44)	142(39.44)	40(11.11)	79.33	7

Table-4 Threats of CHCs as perceived by the respondents

Sl. No.	Statements	Strongly agree	agree	disagree	WM%	rank
1	Political interference is prevailing in society	74(20.56)	80(22.22)	206(57.22)	54.33	5
2	Existence of competition from other private units	182 (50.56)	112 (31.11)	66(18.33)	77.33	2
3	Poor infrastructure available to most farmers	246(68.33)	90(25.00)	24(6.67)	87.33	1
4	Lack of availability of technician for the repair of machine	68(18.89)	96(26.67)	196(54.44)	54.67	4
5	No govt. incentives for the opening of CHCs	44(12.22)	82(22.78)	234(65)	49.00	8
6	Farmers may be losing interest in society with time	60(16.67)	90(25.00)	210(58.33)	52.67	6
7	More wear and tear cost of machinery	86(23.89)	100(27.78)	174(48.33)	58.33	3
8	Lack of professional management in the society	32(8.89)	110(30.56)	218(60.65)	49.33	7

Table-5 Perceived training need for crops stubble management

Area of training	VMN	MN	MON	LN	VLN	WM%
Need to realize the potential harm to the environment by stubble burning and want training for stubble management practices.	32(8.89)	60(16.67)	190(52.78)	48(13.33)	30(8.33)	60.80
Need training on Establishment of Self-help-groups and cooperatives society to provide CHS to farmers	54(15.00)	178(49.44)	70(19.44)	38(10.56)	20(5.56)	71.60
Need training for adoption of alternative measures to stubble burning	62(17.22)	58(16.11)	192(53.33)	36(10.00)	12(3.33)	66.80
Need training regarding for process in upgrading the PACS to CASC (Cooperative Agro Service Centres)	60(16.67)	66(18.33)	194(53.89)	24(6.67)	16(4.44)	67.20
Managing the skilled person requirement, selective demand for the machinery out of various agricultural operations	52(14.44)	98(27.22)	104(28.89)	66(18.33)	40(11.11)	63.00
Need training for Changing the perception of farmers towards the government guidelines to avoid stubble burning and follow stubble management practices	34(9.44)	60(16.67)	172(47.78)	52(14.44)	42(11.67)	59.60
Need the training to know the Various biological aspects of rice straw incorporation in the field	60(16.67)	184(51.11)	52(14.44)	50(13.89)	14(3.89)	72.60
Need training for how to Generate rural employment through establishment of custom hiring centers	36(10.00)	92(25.56)	204(56.67)	14(3.89)	14(3.89)	66.80
Need training for changing the perception of unemployed youth and encouraging them to take up custom hiring of types of machinery as a profession	80(22.22)	58(16.11)	166(46.11)	38(10.56)	12(3.33)	68.60
Need the training to know the various uses of crop residue like for bio-thermal power plants, ushroom cultivation, production of bio-oil, bio-gas etc	56(15.56)	122(33.89)	118(32.89)	40(11.11)	24(6.67)	67.80
Need training for Enlighten farmers with the negative effects of stubble burning on human health, animal health, soil health, crop biodiversity	56(15.56)	184(51.11)	58(16.11)	50(13.89)	12(3.33)	72.40
Need training for Convincing farmers that subsidies could be safeguarded against the risk involved in the under-usage of machinery in the initial years.	44(12.22)	50(13.89)	182(50.56)	60(16.67)	24(6.67)	61.60
Need training about the process involved in the establishment of CHCs and need to create awareness among the farmers about CHCs	56(15.56)	68(18.89)	204(56.67)	16(4.44)	16(4.44)	67.40
Need the training to know the benefits of CHC such as timely sowing and harvesting of crops, Saving time and money etc	42(11.66)	176(48.89)	56(15.56)	60(16.45)	26(7.33)	68.80
Need training for conversation agriculture in the paddy wheat cropping system.	48(13.33)	50(13.89)	176(48.89)	46(12.78)	40(11.11)	61.00

Three districts, namely Ludhiana, Sangrur, and Moga were selected purposively due to the highest burning area and highest number of primary agricultural cooperative societies that provide custom hiring services for agricultural machinery. From each district, 2 blocks were selected randomly. Further from each block, three villages were selected randomly. So, a total of 18 villages was included in the study. Further from each village 20 respondents were selected. Hence, the total sample size of the present study was 360 farmers. SWOT analysis assessed internal and external factors, as well as current and future potential. Strength was operationally defined as the resource or capacity that the Cooperative societies can use effectively to achieve their objectives. Weakness refers to be operationally defined as the limitation, fault, or defect faced by the co-operative societies. Opportunities were operationally defined as the

favorable external factors that could give a Cooperative society a competitive advantage. Threats have been operationally defined as the challenges or problems faced in setting up of CHCs. It was the assessment of the strength and weaknesses of custom hiring centers in the study area. A schedule was developed for the measurement of this variable. It was measured on a three-point continuum scale ranging from strongly agree, Agree to Disagree and scores were assigned 3, 2, and 1 respectively. Finally mean score of each statement was calculated and statements were ranked accordingly. Training need assessment was operationally defined as identifying the training need and development needs of farmers in the management of crop residue. For assessing the training need of farmers in mitigation of stubble burning interview schedule was developed having 16 statements are made that indicate the area of training.

A training needs assessment was measured using the scale on a 5- point continuum ranging from "Very much needed, much needed, moderately needed, less needed, and very less needed with the scores of 5, 4, 3, 2, and 1 respectively. The total training need assessment score for the individual respondent was calculated by summing up the score of sub-items as perceived by the individual farmer. Based on the total score obtained, the training need was categorized into high training need, moderate training need, and low training need using the cumulative square root frequency method.

Results and Discussion

Strength of custom hiring centers

The major strength of CHC was that it helped in reducing the cost of cultivation (mean value of 91.00%) [Table-1]. The second strength of CHCs was the availability of need-oriented services to farmers (mean value of 90.33%). is that Machines provided by societies are effectively working (mean value of 87.33 percent) was perceived as the third strength of CHCs. The fourth strength of CHCs was the appropriate procedure followed in providing services (mean value of 87.00%). The sixth strength of CHCs was the low rent of the machines considered as appropriate (mean value of 81.67%). The eighth strength of CHCs was that machines provided by societies were effectively working (mean value of 79.00%).

Weakness of custom hiring centers

A perusal of [Table-2] delineated that the weakness of CHCs, among which, a major weakness was the high initial cost in the establishment of CHCs (mean value of 92.33%). The second weakness of CHCs was the lack of technical know-how of machinery (mean value of 90.67%). The third weakness of CHCs was found to be the non-regular taking of machines by member farmers with the mean value of 81.67 percent. The fourth weakness of CHCs was the shortage of skilled workers for operating machinery with the mean value of 76.00 percent. The fifth weakness of CHCs was the lack of knowledge about opening process CHCs with a mean value of 74.81. Lastly ordered weakness of CHCs was the non-payment of fixed charges by the members for proper working with the mean value of 51.00 percent. Kumar, *et al.*, (2021) [10] reported that majority of the respondents had favorable attitude towards CHCs, followed by 22.78 per cent of respondents having neutral attitude towards CHCs and only 8.89 per cent of respondents has unfavorable attitude towards CHCs. CHCs were not sufficient in number to cater the high demand during the peak seasons.

Opportunities of custom hiring centers in the study area

The opportunities of CHCs in the study area have been described in [Table-3], the major opportunity of CHCs was that farmer is independence in choosing a required machine with the mean value of 89.00 percent. The second opportunity of CHCs was the help of CHCs in generating rural employment with the mean value of 88.00 percent. Farmers no need to purchase their costly types of machinery, it was perceived as the third opportunity in terms of rank (mean value of 85.00 percent). The fourth opportunity of CHCs was the lack of political interference prevailing in co-operatives (mean value of 84.33%) [Table-3]. The seventh opportunity of CHCs was that Society staff provides best advisory services to member farmers (mean value of 79.33%). The last opportunity in terms of ranking was the prospect of CHCs collaborating with industries for purchasing paddy residue with a mean value of 55.00 percent.

Threats of CHCs as perceived by the respondents

The threat of CHCs have been discussed in [Table-4], among which major threats were poor infrastructure available to most farmers in the establishment of CHCs (mean value of 87.33%). The second threat of CHCs was the existence of competition from other private units with a mean value of 54.33 percent. More wear and tear cost of machinery was prioritized as a third threat (mean value of 58.33%). The fourth threat of CHCs was the lack of availability of technicians for repair of the machine with the mean value of 54.67 percent. The seventh threat of CHCs was the lack of professional management in the society with the mean value of 49.33 percent. No government incentives for the opening of CHCs were

prioritized as the last threat in terms of ranking with a mean score value of 49.00 percent.

Training need assessment of farmers for Crops stubble management

Training need of farmers for crop stubble management has been assessed using a structured interview schedule, it was found that more than half of respondents (52.78%) perceived moderate need training to realize the potential harm to the environment by stubble burning and want training for stubble management practices with the mean value of 60.80 percent [Table-5]. Whereas 49.44 percent of respondents perceived much need training on establishment of Self-help-groups and cooperatives society for providing CHS to farmers with the mean value of 71.60 percent. Similarly, more than half of respondents (53.33%) need training for the adoption of alternative measures to stubble burning with a mean value of 66.80 percent. It was found that 53.89 percent of respondents perceived moderate training need towards the process in upgrading the PACS to CASC (Cooperative Agro Service Centres) with the mean value of 67.20 percent. About 28 percent of respondents moderately need training for managing the skilled person requirement, selective demand for the machinery out of various agricultural operations with the mean value of 63.00 percent. Nearly half of respondents need moderate training for changing the perception of farmers towards the government guideline to avoid stubble burning and follow stubble management practices with the mean value of 59.60 percent. Half of the respondents (51.11%) revealed much training needs to know the various biological aspects of rice straw incorporation in the field with a mean value of 72.60 percent. Whereas 56.67 percent of respondents moderately need training for generating rural employment through the establishment of custom hiring centers with a mean value of 66.60 percent. About 46.11 percent of respondents moderately need training for changing the perception of unemployed youth and encouraging them to take up custom hiring of types of machinery as a profession with the mean value of 68.60 percent. About 33.89 percent of respondents need the training to know the various uses of crop residue like for bio-thermal power plants, mushroom cultivation, production of bio-oil, bio-gas, etc with a mean value of 67.80 percent. Whereas 51.11 percent of respondents much need training for Enlighten farmers with the negative effects of stubble burning on human health, animal health, soil health, crop biodiversity with the mean value of 72.40 percent. About 50.00 percent of respondents moderately need training for convincing farmers that subsidy could be safeguarded against the risk involved in the under-usage of machinery in the initial years with the mean value of 61.60 percent [Table-5]. The majority of respondents (56.67%) moderately need training about the process involved in the establishment of CHCs and need to create awareness among the farmers about CHCs with the mean value of 67.40 percent. About 48.89 percent of respondents need the training to know the benefits of CHC such as timely sowing and harvesting of crops, saving time and money, etc. with the mean value of 68.80 percent. Nearly half of respondents perceived moderate need training for the knowledge of conservation agriculture in the rice-wheat cropping system and process for adoption of it with the mean value of 61.00 percent.

Overall training needs assessment of farmers for stubble management

A perusal of [Table-6] indicated that nearly half of the respondents (46.67 percent) require medium training for stubble management, followed by 32.77 percent of respondents who need low training for stubble management and, only 20.56 percent of respondents that need high training for stubble management.

Table-6 Distribution of farmers based on their overall training needs assessment for mitigation of stubble burning (n=180)

Category	Level of training need (scores)	Frequency	Percentage
Low	Less than 50	59	32.77
Medium	50-56	84	46.67
High	More than 56	37	20.56

Conclusion

The major strength of CHCs was that it would help in reducing the cost of cultivation, the major weakness of CHCs was the high initial cost in the establishment of CHCs, the major opportunity of CHCs was the interdependence of farmers in choosing the required machine, while the major threat of CHCs was

the poor infrastructure available to most of the farmers in the establishment of CHCs. The SWOT analysis of CHCs in the study areas was useful for developmental agencies for further improvement in the CHCs. It was found that nearly half of the respondents (46.67 percent) require medium training for stubble management, followed by 32.77 percent of respondents that need low training for stubble management and only 20.56 percent of respondents that need high training for stubble management.

Application of research

In the study, it was observed that the majority of the respondents need medium training for mitigation of crop residue burning, so it can be recommended that CHCs and other agencies should organize more training programs on residue management in collaboration with ICAR research Institutes, Agriculture Universities, Veterinary University, and KVKs. The findings of the research also applicable for the formulation of policy for mitigation of Crop residues.

Research Category: Sustainable and environment friendly farming practices

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**Principal Investigator or Chairperson of research: Dr H. R. Meena

Institute: ICAR-National Dairy Research Institute, Karnal, 132001, Haryana, India
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Cultivar / Variety / Breed name: Wheat and Paddy grower farmers

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References

- [1] Mittal S.K., Singh N., Agarwal R., Awasthi A. & Gupta P.K. (2009) *Atmospheric Environment*, 43(2), 238-244.
- [2] Kumar P., Kumar S. and Joshi L. (2015) *Springer Briefs in Environmental Science*, 144.
- [3] Kassa B. & Alemu D. (2016) *Ethiopian Journal of Agricultural Sciences*, 27(1), 55-76.
- [4] Kamboj P., Khurana R. and Dixit A. (2012) *Agric Eng Int, CIGRJ*, 14, 123-33.
- [5] Gulati A. & Juneja R. (2020) *ZEF Discussion Papers on Development Policy*, 297.
- [6] Singh S. (2017) *Indian Journal of Agricultural Economics*, 72(3), 230-250.
- [7] Parashunath Hiremath G.M. and Prashanth (2016) *Int J Agric Sci Res*, 6, 217-20.
- [8] Yadav S.R. (2019) *Down to Earth*, 2019.
- [9] Singh S., Kingra H.S. and Sangeet (2013) *Indian Res J Ext Edu.*, 13, 45- 50.
- [10] Kumar K., Meena H.R., Kadian K.S., Meena B.S., Bhandari G. and Kaur J. (2021) *Current Journal of Applied Science and Technology*, 40(21), 70-78.