

# AN EMPIRICAL ANALYSIS OF FARMER'S PERSPECTIVES ON CUSTOM HIRING SERVICE CENTRES IN TUMAKURU DISTRICT OF KARNATAKA

## ABSTRACT

The perception of farmers regarding the usefulness of Custom Hiring Service Centre's refers to their opinions and attitudes toward these facilities, particularly in terms of accessing machinery, cost-effectiveness, productivity benefits, technology adoption, and labor reduction. The study conducted in Tumakuru district of Karnataka during 2020-21 was an "ex post facto" research focusing on farmers' perceptions of the usefulness of hiring centers. Eight taluks were chosen, where Custom Hiring Service Centre's were operated effectively. The results pertaining to the perception towards objectives of Custom hiring centers showed that more than two-fifths of respondents (45.38 %) falling under the medium category with Mean = 32.65 and SD = 3.42, perception towards availability of services in also saw positive outcomes through the services of Custom Hiring Service Centre's. With 42.13 per cent of respondents in the high category and perception towards benefits of CHSC with 46.15 per cent of respondents were categorized as low. The Custom Hiring Service Centre's had a notable impact on overall perception of farmers i.e., more than one third (36.15 %) of the respondents falls under high perception level. The statement farmers pay only for the number of acres or the number of hours used has component loading of 0.83 followed by overcome the problem of labour in agricultural operation with 0.76 component loading. Through the provision of affordable access to a diverse range of farm machinery and equipment, Custom Hiring Service Centre's have significantly enhanced operational efficiency, minimized input losses, and promoted sustainable farming practices.

**Keywords:** Custom Hiring Service Centers, Component loading, Labour, Perception

## Highlights

The objective of the study is to analyse the farmer's perspectives on Custom Hiring Service Centres in Tumakuru district of Karnataka.

## 1. INTRODUCTION

Farm mechanization in India has emerged as a critical facet of agricultural development, revolutionizing traditional farming practices and significantly enhancing efficiency of valuable resources like seeds, chemicals, fertilizers, and irrigation. It not only boosts production and productivity but also enhances profitability by reducing unit production costs. However, the lack of adequate farm power and machinery, especially among small-scale farmers, has long been identified as a significant obstacle to increasing agricultural output and efficiency. The integration of technology into farming operations promises benefits in terms of streamlined implements for various tasks. From tractors and harvesters to irrigation systems and precision farming technologies, the scope of mechanization in Indian agriculture has expanded significantly, catering to the diverse needs and challenges faced by farmers across different regions and crop types. The average farm power needs to be increased from the current 1.43 kW/ha to at least 2 kW/ha to get timeliness and quality in farm operations (NABARD). With climate change posing challenges, the utilization of high-capacity and energy-efficient farm machinery becomes even more critical. Timeliness, especially in activities like sowing and intercultural operations, holds paramount importance for ensuring optimal crop production and sustainable productivity. In rain-fed regions of India, any delay of 6 to 8 weeks in the monsoon season triggers concern among farmers, as it affects the timely completion of sowing by the end of July. Furthermore, activities such as hoeing, irrigation, intercultural operations, fertilization, processing, harvesting, threshing, and marketing must be carried out punctually to prevent adverse impacts on farm productivity and income. Farm power availability from human and animal sources are reducing for the past 20 years, farm power from tractors, mechanical and electrical sources availability increased 20 folds in the same period (Srinivasarao *et al.*, 2013).

Custom hiring of farm machinery was first introduced in Indian agriculture in the 19<sup>th</sup> century (Srinivasarao *et al.*, 2013). Initially, the Government of Karnataka initiated the funding of Custom Hiring Service Centres (CHSCs) through Primary Agricultural Credit Co-operative Societies (PACS) in 2010-11 under the Rashtriya Krishi Vikas Yojana (RKVY). Tractors and associated equipment were supplied to address the needs of small and marginal farmers. The distribution of machinery across CHSCs in Karnataka considered factors like agro-climatic conditions, crop patterns, machinery density, and demand. Subsequently, in 2014, the Department of Agriculture proposed establishing 186 CHSCs. During the first year, the government subsidized 75.00 percent (Rs 37.50 lakhs), while participant entities contributed 25.00 percent (Rs 12.50 lakhs). This funding model continued in subsequent years. Priority was given to registered charitable trusts/agencies, non-governmental organizations, farmer producer organizations, and farm machinery manufacturers/individuals with successful CHSC operations for creating additional centers.

In July 2014, the Government of Karnataka designated two private entities to manage 178 CHSCs in the state: Shri Kshetra Dharmasthala Rural Development Project (SKDRDP) and the Indian Society of Agri-business Professionals, New Delhi, operating 161 and 17 centers respectively. The responsibility for determining hiring and operation charges for tractors and farm equipment rests with the District

Implementation Committee. This committee, led by the Chief Executive and Joint Director of Agriculture, includes representatives from leading farm machinery manufacturers, the Assistant Director of Agriculture, and two progressive farmers/Krishiprashasthi award winners. Hiring charges are set based on factors such as fuel prices, maintenance costs, driver wages, wear and tear, and other expenses. Karnataka's agricultural landscape comprises numerous small farms with less than 2 hectares of land, often facing economic hardship. Given the economic challenges of single farm ownership and equipment utilization, custom hiring service centres have emerged as a promising solution to mechanize farming operations. Through the custom hiring of agricultural machinery, even small and marginal farmers have gained access to mechanization, potentially transforming Karnataka's farm mechanization scenario. The present study provides an information about the custom hiring service centres present in different areas in the Tumakuru district and also aims to document the perception of the usefulness of custom hiring service centre by farmers, the results of the study will benefit the extension services, researchers and policymakers concerned and help to revisit and improve the expansion efforts by understanding empirically the need for farm machinery and equipment under the personalized hiring program.

Perception serves as the active process by which individuals become aware of the objects and events in their surroundings. The diversity in human experience and cognitive styles ensure that the same situation can be interpreted in various ways by different individuals. Expectations, desires, and cognitive frameworks significantly influence how individuals perceive and interpret their surroundings, shaping their understanding of what they seek to observe. Moreover, perceptions are not haphazard but rather structured, as individuals naturally tend to organize their sensory experiences in a manner that aligns with their cognitive frameworks, allowing for a coherent and meaningful interpretation of the world around them.

## **LIMITATIONS OF STUDY**

The present investigation mainly relied on the data collected from farmers using custom hiring services through personal interview method by using a semi-structured schedule. Therefore, a certain amount of recall bias is bound to be associated with the data collected, since the farmers have not kept any record of diesel use, the number of hours hired, the cost of cultivation, the use of inputs, and returns. At the time of data collection, however, efforts were made to minimize them through cross-checks.

## **Future scope**

1. The study was conducted in Tumakuru District of Karnataka. It is proposed that similar studies could be carried out in other districts of the state.
2. There is a scope for research study on the impact of custom hiring service centres on the farmer.

## **2. METHODOLOGY**

### **2.1 Research design**

The research design utilized for this study was the Ex-post-facto research design, chosen due to the preexistence of the phenomenon under investigation. Ex-post-facto analysis involves a systematic empirical research approach where the researcher lacks direct control over independent variables. This is either because their occurrences have already transpired or because they are not naturally subject to manipulation

## **2.2 Selection of Respondents**

The study was conducted in the Tumakuru district of Karnataka, which was purposefully chosen due to the widespread implementation and successful operation of Custom Hiring Service Centres (CHSCs) across all ten taluks within the district. Out of these, eight taluks were deliberately selected due to the presence of efficiently operating CHSCs. These chosen taluks include Kunigal, Tumkur, Koratagere, Turuvekere, Gubbi, Tiptur, Madhugiri, and Sira, each hosting CHSCs functioning at the Hobli level. Total 13

CHSCs which are working successfully are selected, A list of farmers registered in CHSCs was prepared, the registered farmers were provided with Unique Identification Number (UIN). by using a simple random sampling method without replacement 10 respondents in each of the CHSCs is selected. Thus, total sample size consists of the study was 130 farmers.

### 2.3 Perception of the usefulness of custom hiring service centres

A semi-structured schedule was developed containing 23 statements pertaining to the perception of farmers regarding Custom Hiring Service Centers (CHSC). These statements were administered to 130 respondents to gauge their perceptions of CHSCs. Each respondent provided responses to each statement using a five-point scale: strongly agree (5), agree (4), undecided (3), disagree (2), and strongly disagree (1). Based on the classification as followed by Sindhu (2017). The total possible score range was calculated, with a maximum score of 115 and a minimum of 23 for farmer perceptions of CHSCs.

Respondents were categorized into three groups based on their perception scores, utilizing the mean (X) and standard deviation (SD) as control measures.

Category	Score
Low	Less than $(\text{Mean} - \frac{1}{2}\text{SD})$
Medium	Between $(\text{Mean} + \frac{1}{2}\text{SD})$
High	More than $(\text{Mean} + \frac{1}{2}\text{SD})$

#### Mean

The arithmetic mean is the sum of the scores divided by the number of scores. This measure was used to classify the dependent variable into low, medium, high categories.

#### Standard deviation

It is defined as the square root of the arithmetic mean of the sum of the square of the deviation taken from the arithmetic mean. This test was used to classify the dependent variable into low, medium, high categories.

#### Frequency

This measure was used to understand the pattern of distribution of variable knowledge among respondents and to categorize the perception of importance by farmers and to check the knowledge about the legal procedure for establishing the CHSC.

## Percentage

This measure was used for simple comparisons.

$$\text{Percentage} = \frac{\text{No. of respondents}}{\text{Total No. of respondents}} \times 100$$

## 2.4 Factor analysis

Factor analysis, a dimension reduction technique was used to identify the factors influencing perception of dairy farmers about the gender disparity. It is a multivariate technique which uses the correlation matrix as input to identify interrelationships between the variables and helps the researcher to convert a large number of highly related variables into a convenient number of latent variables called factors. Factors are the linear combination of variables considered in the study. The factor loadings corresponding to each variable provide the correlation between that particular variable and the underlying factor. **As followed by Bhat (2021)**

Factor analysis in matrix form can be represented as below:

$$X_{n \times N} = A_{n \times m} \times F_{m \times N}$$

Where,

' $X$ ' is the matrix of variables

' $A$ ' is the matrix of factor loadings ( $a_{ij}$ ) ' $F$ ' is

the matrix of factors

$a_{ij}$  is the net correlation between  $j^{\text{th}}$  factor and  $i^{\text{th}}$  observed variable ' $n$ ' is

the number of variables

' $m$ ' is the number of factors

' $N$ ' is the number of respondents

The extraction of factors depends on the magnitude of eigenvalues or the scree plot. The maximum number of factors that could be extracted is equal to the number of variables considered in the study. Factor analysis being a dimension reduction tool was used to reduce variables into handy number of latent variables called as Factors. The analysis was performed using SPSS software following principal component method for extraction of factors. With the conception that perception regarding objectives, availability of the services and benefits of Custom Hiring Service Centre's were analyzed.

In this context, the factor analysis was performed separately for the responses elicited from farmers on different statements under three components through five-point continuum. The sample adequacy is a prerequisite for factor analysis, tested using Kaiser-Meyer-Olkin (KMO). If the obtained KMO value is greater than 0.6 then it indicates that the sample is adequate to draw meaningful inferences out of factor analysis. The Bartlett's test of sphericity was to test the validity and suitability of the data for factor analysis. A significant chi-square value of Bartlett's test indicates that the data is suitable for factor analysis. To draw meaningful inferences from factor analysis, resorting to rotation of factors become crucial. Various techniques of rotation are available viz., varimax, equimax, orthogonal etc. In the present study, varimax rotation was employed for rotating factors and variables underlying in it to draw meaningful inferences. Later, based on the variables having highest factor loading in the respective factor, latent variable (factor) was nomenclated. The nomenclature of latent factor is highly subjective it purely depends on the ingenuity of the researcher and expertise in the subject.

### **3. RESULTS AND DISCUSSION**

#### **3.1 Statement wise distribution of farmers with respect to perception towards usefulness of custom hiring service centres**

The perception of farmers towards the usefulness of Custom Hiring Service Centers (CHSC) was assessed based on various statements related to the objectives, availability of services, and benefits provided by these centers. The mean scores and ranks for each statement are presented in Table 1.

##### **3.1.1 Perception towards Objectives of CHSC**

The statement "Overcome the problem of labour in agricultural operations" secures the top rank with an impressive mean score of 4.70, this highlights the pivotal role of custom hiring service centers in alleviating labor shortages in agriculture. These centers offer farmers access to mechanized equipment, enabling them to streamline operations, boost productivity, and tackle labor challenges effectively. By reducing reliance on manual labor, farmers can mitigate the risks associated with labor scarcity, ensuring timely completion of tasks and optimizing agricultural output. This underscores the indispensable contribution of custom hiring service centers in modernizing agricultural practices and enhancing the resilience and sustainability of the agricultural sector. Furthermore, the statement " Helps to maintain timeliness in an agricultural operation" consistently attains the second rank with a commendable mean score of 4.55, this underscores the significant contribution of custom hiring service centers in preserving timeliness within agricultural operations. By providing access to modern machinery and equipment, these centers enable farmers to execute tasks efficiently and promptly. Timely completion of operations such as sowing, cultivation, and harvesting is crucial for maximizing crop yields and optimizing farm productivity. Custom hiring service centers facilitate this by offering farmers the resources needed to adhere to seasonal timelines and meet agricultural deadlines, ultimately enhancing the overall efficiency and effectiveness of farming practices. Additionally, the statement " Helps to carry out sowing on time with minimum labour"

consistently secures the third rank with a substantial mean score of 4.31, CHSCs provides access to mechanized equipment, these centers empower farmers to efficiently sow crops, ensuring adherence to planting schedules while reducing labor requirements.

### **3.1.2 Perception towards Availability of Services in CHSC**

It is noteworthy that the statement "Repairs of the machinery are done in CHSC" holds the top position, boasting a commendable mean score of 4.72, this statement underscores their pivotal role in ensuring operational efficiency. Timely repairs conducted on-site alleviate downtime, enabling farmers to resume operations swiftly. This convenience minimizes disruptions during critical phases of agricultural activities, enhancing overall productivity. Additionally, by offering repair services, CHSCs foster trust and reliability among farmers, further solidifying their position as indispensable partners in modern agricultural practices, where dependable machinery maintenance is essential for sustaining farm operations. Following closely, the statement "Modern machinery is available in CHSC" secures the second rank with a respectable mean score of 4.45, this reflects their commitment to offering state-of-the-art equipment and ensures farmers access to efficient and advanced technology, enhancing productivity and output quality. Demonstrating the CHSC's profound impact, the third rank in this category is secured by the statement "The pre-booking service facility is available" with a noteworthy mean score of 4.33, the pre-booking service facility signifies CHSCs' dedication to convenience and customer satisfaction. This allows farmers to plan operations effectively, ensuring timely access to required machinery. Together, these aspects demonstrate CHSCs' proactive approach in meeting farmers' evolving needs while streamlining operations for improved agricultural efficiency and sustainability. These rankings and associated mean scores are reflective of the Perception towards availability of services in CHSC.

### **3.1.3 Perception towards benefits of CHSC**

The top-ranked statement, "The farmer pays only for the number of acres or the number of hours used" with a mean score of 4.76, this exemplifies the financial flexibility and efficiency offered by Custom Hiring Service Centres (CHSCs). This system allows farmers to minimize costs by paying solely for the services utilized, eliminating the need for upfront capital investment in machinery. It also ensures equitable pricing, particularly beneficial for small-scale and marginal farmers with limited resources. By embracing this payment approach, CHSCs empower farmers to access modern agricultural equipment without the financial burden of ownership, promoting sustainable and inclusive agricultural practices while enhancing overall farm profitability. Additionally, the second-ranked statement, "There is a provision of using machines as per the requirement of booking" with a mean score of 4.49, this underscores the flexibility and tailored service offerings of Custom Hiring Service Centres (CHSCs) which ensures that farmers can access the specific machinery needed for their operations, optimizing resource utilization and enhancing operational efficiency. Furthermore, the third-ranked statement, "There is no need for the farmers for long-term capital investment in the machine" with a mean score of 4.47, this reflects the financial advantage and risk mitigation afforded

by this model where farmers can access modern machinery without the burden of ownership, freeing up capital for other essential farm investments and reducing financial strain.

**Table 1: Statement wise distribution of farmers with respect to perception towards usefulness of custom hiring service centres**

(n=130)

Sl. No.	Statements	Mean score	Rank
<b>A</b>	<b>Perception towards objectives of CHSC</b>		
1	Overcome the problem of labour in agricultural operations	4.70	I
2	Help to maintain timeliness in an agricultural operation	4.55	II
3	Farm machinery is available at a reasonable cost for small and marginal farmers	4.11	V
4	Farm machinery at CHSC attracts rural youth towards agriculture	3.33	VIII
5	Help to carry out sowing on time with minimum labour	4.31	III
6	Help to carry out the inter-cultural operations on time	4.29	IV
7	Harvesting with machines will help to reduce the wastage in production	3.88	VI
8	Timely use of sprayers for IPM practice will help in the control of pest and disease	3.48	VII
<b>B</b>	<b>Perception towards availability of services in CHSC</b>		
1	Modern machinery is available in CHSC	4.45	II
2	The pre-booking service facility is available	4.33	III
3	Expert drivers and operators are available	3.81	V
4	Quality service is available	3.87	IV
5	Visiting farmers field after completion of the work	1.21	VI
6	Repairs of the machinery are done in CHSC	4.72	I
<b>C</b>	<b>Perception towards benefits of CHSC</b>		

1	There is no need for the farmers for long term capital investment in the machine.	4.47	III
2	Hiring farmer has no responsibility for operating the machine.	4.42	IV
3	The farmer pay only for the number of acres or the number of hours used.	4.76	I
4	Machinery which is given for hiring is mostly in good condition.	4.06	VII
5	Improve the quality of work.	4.10	V
6	Maintain timeliness of agricultural operation.	3.95	IX
7	Custom hiring of farm machinery and implements will reduce the cost of cultivation.	4.05	VIII
8	Custom hiring make timely availability of farm machinery and implements.	4.07	VI
9	There is a provision of using machines as per the requirement of booking	4.49	II

### 3.2 Component wise distribution of farmers with respect to perception towards usefulness of custom hiring service centres

The Table 2 and Fig. 1 provides a comprehensive overview of the distribution of farmers in different perception components as part of the usefulness of custom hiring service centres. The CHSCs made progress in enhancing perception towards objectives of CHSC among the farmers. With more than two-fifths of respondents (45.38 %) falling under the medium category and 30.00 per cent under the high category followed by 24.62 percent in low category. This variability suggests that while a significant portion of farmers recognizes the potential benefits and utility of CHSC objectives, a notable segment remains unconvinced or uncertain. Factors influencing these perceptions could include past experiences with CHSCs, access to information, and contextual differences in agricultural practices and needs. Understanding these nuances is critical for tailoring CHSC initiatives to better meet farmers' expectations and address potential areas of concern.

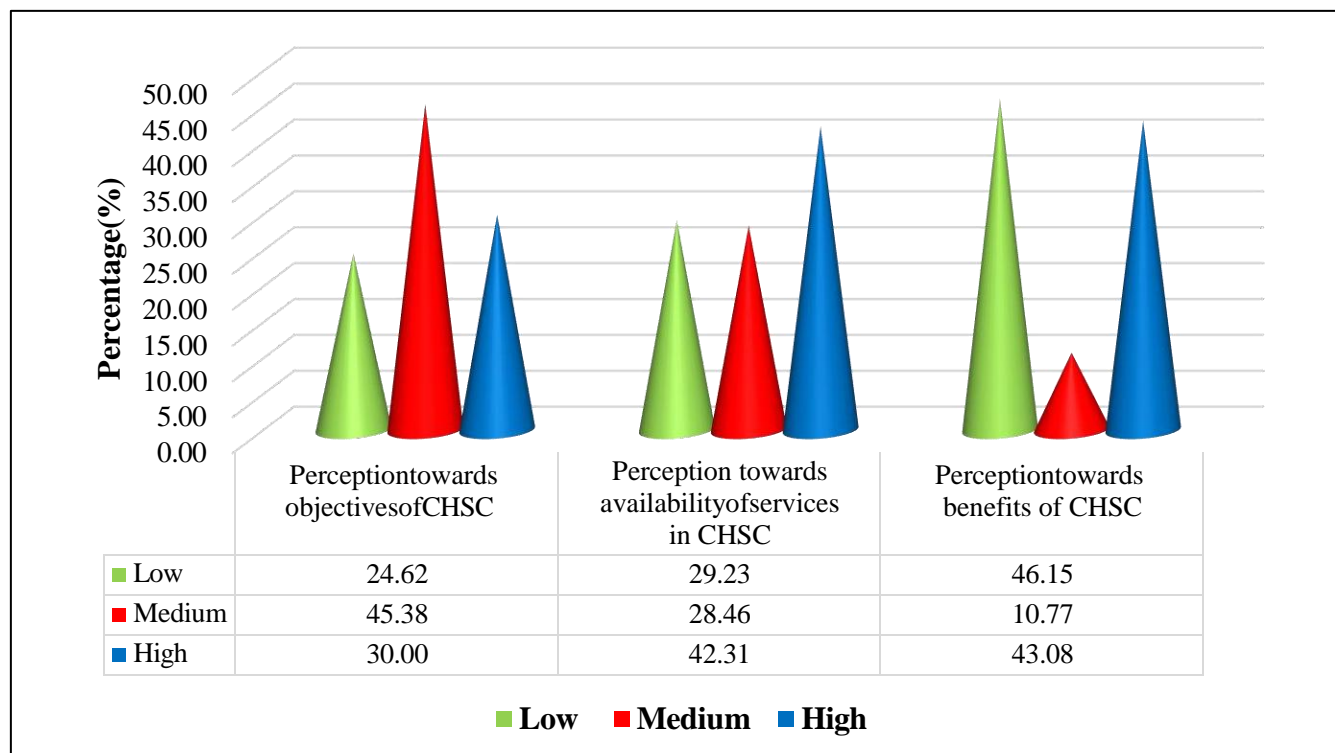
Perception towards availability of services in CHSC also saw positive outcomes through the services of CHSCs. With 42.13 percent of respondents in the high category and 29.23 percent in the low category followed by 28.46 percent in medium category. This suggests that a significant segment of farmers acknowledges satisfactory access to services offered by CHSCs. To address perceptions of low service availability, CHSCs could consider expanding their service offerings, improving infrastructure, or enhancing communication channels to ensure farmers are aware of the available services. Additionally, efforts to maintain and upgrade equipment, streamline booking processes, and provide timely assistance can help elevate perceptions of service availability and enhance the overall effectiveness of CHSCs in meeting farmers' needs.

The CHSCs had a notable impact on the Perception towards benefits of CHSC. While 46.15 per cent of respondents were categorized as low and 43.08 per cent in the high category followed by 10.77 per cent of farmers in medium category. This highlights a segment of farmers who may not fully appreciate or recognize the advantages offered by CHSCs. This could be attributed to factors such as lack of awareness, limited access to CHSCs, or past negative experiences and also some farmers indicating a strong recognition of the advantages provided by CHSCs. This suggests that farmers acknowledge the positive impact of CHSCs on various aspects of their agricultural operations, such as cost-effectiveness, convenience, and access to modern machinery. The medium perception category farmers indicate a moderate stance on the benefits of CHSCs. Efforts to address perceptions of low benefits could involve increasing awareness through outreach programs, enhancing service quality and variety, and fostering stronger partnerships between CHSCs and farming communities. Overall, understanding and addressing the diverse perceptions of CHSC benefits are crucial for optimizing their effectiveness and ensuring their continued contribution to agricultural development and sustainability.

**Table 2: Component wise distribution of farmers with respect to perception towards usefulness of custom hiring service centres**

(n=130)

Sl. No.	Perception components	Categories	f	Percent
1	Perception towards objectives of CHSC Mean = 30.94 SD=34.36	Low < (Mean - ½SD)	32	24.62
		Medium (Mean + ½SD)	59	45.38
		High > (Mean + ½SD)	39	30.00
2	Perception towards availability of services in CHSC Mean=21.13 SD=23.66	Low < (Mean - ½SD)	38	29.23
		Medium (Mean + ½SD)	37	28.46
		High > (Mean + ½SD)	55	42.31
3	Perception towards benefits of CHSC Mean = 38.24 SD=39.80	Low < (Mean - ½SD)	60	46.15
		Medium (Mean + ½SD)	14	10.77
		High > (Mean + ½SD)	56	43.08



**Fig1: Components wise distribution of farmers with respect to perception towards usefulness of custom hiring service centres**

### 3.3 Overall perception of farmer towards usefulness of custom hiring service centres

Table 3, presents an overview of farmers' overall perception regarding the usefulness of Custom Hiring Service Centers (CHSCs), based on mean scores and standard deviations. The mean perception score of 93.43 indicates a generally positive outlook towards CHSCs among respondents. The distribution across categories reveals that the majority of farmers fall within the medium and high perception categories, constituting 33.08% and 36.15% of respondents, respectively. This suggests that a significant proportion of farmers perceive CHSCs as valuable resources for meeting their agricultural needs, such as accessing modern machinery, reducing labor costs, and enhancing operational efficiency. However, it is noteworthy that 30.77% of respondents perceive CHSCs' usefulness as low, indicating a portion of farmers who may not fully recognize or appreciate the benefit offered by these centers. Addressing the concerns and needs of this segment is crucial for enhancing the overall acceptance and effectiveness of CHSCs within agricultural communities.

Efforts to improve CHSCs' services, increase awareness among farmers, and address specific challenges or barriers faced by users can help elevate perceptions and ensure CHSCs' continued role in supporting sustainable agriculture. Overall, understanding farmers' perceptions and adapting CHSCs'

strategies accordingly are essential for optimizing their impact and fostering positive relationships with farming communities.

**Table 3: Overall perception of farmer towards usefulness of custom hiring service centres**

(n=130)

Categories	Frequency	Percent
Low < (Mean - ½SD)	40	30.77
Medium (Mean + ½SD)	43	33.08
High > (Mean + ½SD)	47	36.15
Total	130	100
<b>Mean=93.43</b>		<b>SD =5.82</b>

### 3.4 Factors influencing perception of farmer towards usefulness of custom hiring service centres

In assessing levels of perception, it's essential to discern the underlying factors driving such perceptions. In our study, we conducted factor analysis to identify the key factors influencing the perception towards the objectives, availability of services and benefits of CHSC. (Refer to Table 4). Firstly, we evaluated the appropriateness of factor analysis using the Kaiser-Meyer-Olkin (KMO) statistic. A KMO value below 0.5 would suggest sample inadequacy, rendering inferences from factor analysis unreliable. Fortunately, our study yielded a KMO statistic value of 0.71, 0.68 and 0.71 towards perception regarding objectives, availability of services and benefits of CHSC respectively indicating the sample's adequacy for analysis. Additionally, we employed Bartlett's test of Sphericity to compare the observed correlation matrix with an identical one, aiming to address redundancy among variables. This test, significant at the 1% level with a chi-square statistic value of 1216.38, 844.59 and 1123.25, confirmed the presence of correlations among variables, supporting the application of factor analysis. Around 8, 6 and 9 statements pertaining to, perception regarding objectives, availability of services and benefits of CHSC were utilized for principal component method for factor extraction. Factors were determined based on eigenvalues and the scree plot technique. Notably, the first factor contributed substantially to the total variation, followed by the remaining factors in descending order of magnitude. These extracted factors represent latent variables, representing linear combinations of the different factors under study. Naming these latent variables is crucial in factor analysis, considering they represent unobserved constructs. We carefully described the contribution of each extracted factor, along with their respective names, to enhance understanding and interpretation.

#### 3.4.1 Perception towards objectives of CHSC

The first factor contributed 12.14 percent to the total variation in the dataset (Table, 4) The variable 'overcome the problem of labour in agricultural operations' received highest factor loading of 0.76 it was

mainly due to CHSCs significant contribution to explaining variability in farmer's perceptions which underscores the pivotal role of CHSCs in addressing labour challenges and enhancing agricultural productivity through mechanization, followed by variable 'helps to maintain timeliness in an agricultural operation' (0.75) this was mainly due to availability of pre-booking services which helps farmers in accessible to modern machineries to carry out particular field operations in a stipulated time period, 'Helps to carry out sowing on time with minimum labour'(0.70), 'Helps to carry out the intercultural operations on time'(0.69) and 'Farm machinery is available at a reasonable cost for small and marginal farmers'(0.66). Then naming of latent variable *i.e.*, first factor was done based on the variable/shaving highest/higher factor loading/s. The variables which have received highest loading signals the perception towards the achievement of CHSC objectives.

#### **3.4.2 Perception towards availability of services in CHSC**

The total variation in the data set was 8.67 per cent (Table, 4). The statements contributing perception towards availability of services in CHSC were 'Repairs of the machinery are done in CHSC' (0.77) has got highest factor loading underscores that CHSC look after the regular maintenance of machineries and also undertakes the activities of repair and replacement of damaged/inoperable machineries in the centre. Followed by 'modern machinery are available in CHSC' was contributed (0.71) it was mainly due to majority of the farmers in the study are belong to small and marginal category hence, they can't invest huge capital on modern machineries' as expressed by farmers in the study area. And the variable 'pre-booking service facility was available' was contributed (0.69) among the other variables analyzed under the study.

#### **3.4.3 Perception towards benefits of CHSC**

Custom Hiring Service Centers (CHSCs) play a significant role in agricultural sectors, especially in countries where smallholder farming is prevalent. The first variable 'farmer pays only for the number of acres or the number of hours used (0.83) was contributed highest among other variables, this was due to hiring charges of CHSCs in the study area was fixed by the district implementation committee and these charges wouldn't vary with the demand and time thus farmers are allowed to pay only for the service taken. Followed by 'there is no need for the farmers for long term capital investment in the machineries' carries a component loading of (0.77) which was due to the fact that services of CHSC are affordable in the same line it helps farmers in reducing cost of production addition to that also helps in increasing livelihood security of the farmers. Additionally, the variable such as 'there is a provision of using machines as per the requirement of booking' has got the factor loading of (0.72), and 'hiring farmer has no responsibility for operating the machine' has got loading of (0.66) among other analyzed variables.

**Table 4: Factors influencing perception of farmers towards usefulness of custom hiring servicecentres**

(n=130)

Sl. No.	Statements	Component loadings
<b>A</b>	<b>Factor1: Perception towards objectives of CHSC</b>	
1	Overcome the problem of labour in agricultural operations	0.76
2	Help to maintain timeliness in an agricultural operation	0.75
3	Farm machinery is available at a reasonable cost for small and marginal farmers	0.66
4	Farm machinery at CHSC attracts rural youth towards agriculture	0.18
5	Help to carry out sowing on time with minimum labour	0.70
6	Help to carry out the intercultural operations on time	0.69
7	Harvesting with machines will help to reduce the wastage in production	0.55
8	Timely use of sprayers for IPM practice will help in the control of pest and disease	0.32
	<b>Percent of variance</b>	23.58 %
	<b>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</b>	0.71
	<b>Bartlett's test of Sphericity (Chi square value) (P-value = 0.001)</b>	1216.38***
<b>B</b>	<b>Factor2: Perception towards availability of services in CHSC</b>	
1	Modern machinery is available in CHSC	0.71
2	The pre-booking service facility is available	0.69
3	Expert drivers and operators are available	0.61
4	Quality service is available	0.58
5	Visiting farmers field after completion of the work	0.51
6	Repairs of the machinery are done in CHSC	0.77
	<b>Percent of variance</b>	25.90 %
	<b>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</b>	0.68
	<b>Bartlett's test of Sphericity (Chi square value) (P-value = 0.001)</b>	844.59***
<b>C</b>	<b>Factor3: Perception towards benefits of CHSC</b>	
1	There is no need for the farmers for long term capital investment in the machineries.	0.77
2	Hiring farmer has no responsibility for operating the machine.	0.66

3	The farmer pay only for the number of acres or the number of hours used.	0.83
4	Machinery which is given for hiring is mostly in good condition.	0.31
5	Improve the quality of work.	0.35
6	Maintain timeliness of agricultural operation.	0.59
7	Custom hiring of farm machinery and implements will reduce the cost of cultivation.	0.43
8	Custom hiring make timely availability of farm machinery and implements.	0.64
9	There is a provision of using machines as per the requirement of booking	0.72
	<b>Percent of variance</b>	21.89 %
	<b>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</b>	0.72
	<b>Bartlett's test of Sphericity (Chi square value) (P-value = 0.001)</b>	1123.25***

#### 4. CONCLUSION

Farm mechanization holds immense potential to catalyze agricultural transformation in India, offering a pathway towards enhancing farm productivity, improving livelihoods, and ensuring food security in the face of evolving global challenges. Despite significant progress, challenges remain in the widespread adoption of farm mechanization in India. Issues such as high initial investment costs, access to credit, infrastructure constraints, and the need for skill development and training pose barriers to adoption, particularly among small and marginal farmers. Custom Hiring Service Centre's have emerged as instrumental facilitators in the agricultural landscape of India, particularly in addressing the mechanization needs of small and marginal farmers. Through the provision of affordable access to a diverse range of farm machinery and equipment, CHSCs have significantly enhanced operational efficiency, minimized input losses, and promoted sustainable farming practices. In essence, the success of custom hiring centers in India underscores the transformative potential of collaborative mechanization models in revolutionizing agricultural practices, improving farmer livelihoods, and contributing to the overall socio-economic development of rural communities. Moving forward, sustained efforts to strengthen and expand the custom hiring centers network will be essential in harnessing the full benefits of agricultural mechanization and realizing the vision of a prosperous and sustainable agrarian economy in India.

#### COMPETING INTERESTS

All the authors are declared that there is no competing of interest exists.

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