ANEMPIRICALANALYSISOFFARMER'SPERSPECTIVESONCUSTOMHIRING 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,productivitybenefits,technologyadoption,andlaborreduction. Thestudyconductedin 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 operatedeffectively.Theresultspertainingtotheperceptiontowardsobjectivesof Custom hiring centers showedthatmore than two-fifths of respondents (45.38 %) falling under the medium category with Mean = 30.94 and SD = 34.36,perceptiontowardsavailabilityofservicesinalsosawpositiveoutcomesthroughtheservices 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 perceptionlevel.Thestatementfarmerspayonlyforthenumberofacresorthenumberofhoursusedhas component loading of 0.83 followed by overcome the problem of labour in agricultural operation with 0.76 component loading. Throughtheprovisionofaffordableaccesstoadiverserangeoffarm machinery and equipment, Custom Hiring Service Centre's have significantly enhanced operational efficiency, minimized input losses, and promoted sustainable farming practices.

Keywords:CustomHiringServiceCenters,Componentloading, Labour, Perception

Highlights

The objective of the study is to analyses 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, revolutionizingtraditionalfarmingpracticesandsignificantlyenhancingefficiencyofvaluableresourceslike seeds,chemicals,fertilizers,andirrigation.Itnotonlyboostsproductionandproductivitybutalsoenhances 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 croptypes.Theaveragefarmpowerneedstobeincreasedfromthecurrent1.43kW/hatoatleast2kW/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 optimalcropproductionandsustainableproductivity.Inrain-fedregionsofIndia,anydelayof6to8weeks 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,andmarketingmustbecarriedoutpunctuallytopreventadverseimpacts onfarmproductivityandincome.Farmpoweravailabilityfromhumanandanimalsourcesarereducingfor 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 19th century (Srinivasarao *et al.,* 2013). Initially, the Government of Karnataka initiated the funding of Custom Hiring Service Centres (CHSCs) through PrimaryAgricultural Credit Co-operative Societies (PACS) in 2010-11 under the Rashtriya Krishi Vikas Yojana (RKVY). Tractors and associated equipment were supplied to addresstheneedsofsmallandmarginalfarmers.ThedistributionofmachineryacrossCHSCsinKarnataka considered factors like agro-climatic conditions, crop patterns, machinery density, and demand. Subsequently, in 2014, the Department ofAgriculture proposed establishing 186 CHSCs. During the first year,thegovernmentsubsidized75.00percent(Rs37.50lakhs),whileparticipantentitiescontributed25.00 percent (Rs 12.50 lakhs). This funding model continued in subsequent years. Priority was given to registeredcharitabletrusts/agencies,non-governmentalorganizations,farmerproducerorganizations,and farmmachinerymanufacturers/individualswithsuccessfulCHSCoperationsforcreatingadditionalcenters.

InJuly2014,theGovernmentofKarnatakadesignatedtwoprivateentitiestomanage178CHSCs 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 determininghiringandoperationchargesfortractorsandfarmequipmentrestswiththeDistrict

Implementation Committee. This committee, led by the Chief Executive and Joint Director ofAgriculture, includesrepresentativesfromleadingfarmmachinerymanufacturers,theAssistantDirectorofAgriculture, andtwoprogressivefarmers/Krishiprashasthiawardwinners.Hiringchargesaresetbasedonfactorssuch 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. Throughthecustomhiringofagriculturalmachinery,evensmallandmarginalfarmershavegainedaccess to mechanization, potentially transforming Karnataka's farm mechanization scenario. The present study providesaninformationaboutthecustomhiringservicecentrespresentindifferentareasintheTumakuru 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 concernedandhelptorevisitand improvetheexpansionefforts byunderstanding empiricallytheneedfor farm machinery and equipment under the personalized hiring program.

Perception serves as the active process by which individuals become aware of the objects and eventsintheirsurroundings.Thediversityinhumanexperienceandcognitivestylesensuresthatthesame 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 understandingofwhattheyseektoobserve.Moreover, perceptionsarenothaphazardbutratherstructured, asindividualsnaturallytendtoorganizetheirsensoryexperiencesinmannersthatalignwiththeircognitive frameworks, allowing for a coherent and meaningful interpretation of the world around them.

2. METHODOLOGY

2.1 Researchdesign

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 empiricalresearch approachwheretheresearcherlacksdirectcontrol overindependentvariables.This is either because their occurrences have already transpired or because they are not naturally subject to manipulation

2.2 SelectionofRespondents

The study was conducted in the Tumakuru district of Karnataka, which was purposefully chosen duetothewidespreadimplementationandsuccessfuloperationofCustomHiringServiceCentres(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,andSira,eachhostingCHSCsfunctioningattheHoblilevel.Total13

CHSCs which are working successfully are selected,Alist of farmers registered in CHSCs was prepared, the registered farmers were provided with Unique Identification Number (UIN). by using a simple random samplingmethodwithoutreplacement10respondentsineachoftheCHSCisselected.Thus,totalsample size consists of the study was 130 farmers.

2.3 Perceptionoftheusefulnessofcustomhiringservicecentres

Asemi-structuredschedulewasdevelopedcontaining23statementspertainingtotheperception offarmersregardingCustomHiringServiceCenters(CHSC).Thesestatementswereadministeredto130 respondentstogaugetheirperceptionsofCHSCs.Eachrespondentprovidedresponsestoeachstatement using a five-point scale: strongly agree (5), agree (4), undecided (3), disagree (2), andstrongly disagree (1).Thetotalpossible scorerangewascalculated, witha maximum scoreof 115 and aminimum of23for 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.

Chart 1: Category

Category	Score
Low	Lessthan(Mean-½SD)
Medium	Between(Mean+½SD)
High	Morethan(Mean+½SD)

Mean

Thearithmeticmeanisthesumofthescoresdividedbythenumberofscores.Thismeasurewas usedtoclassifythedependentvariableintolow,medium,highcategories.

Standarddeviation

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 respondentsandtocategorizetheperceptionofimportancebyfarmersandtocheckthe knowledgeabout the legal procedure for establishing the CHSC.

Percentage

Thismeasurewasusedforsimplecomparisons.

$$\text{Percentage} = \frac{\text{No.ofrespondents}}{\text{TotalNo.ofrespondents}} \times 100$$

2.4 Factoranalysis

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 correspondingtoeachvariableprovidesthecorrelationbetweenthatparticularvariableandtheunderlying factor.

Factoranalysisinmatrixformcanberepresentedasbelow:

$$X_{nxN} = A_{nxm} x F_{mxN}$$

Where,

'X'isthematrixofvariables

'*A*'isthematrixoffactorloadings(a_i) '*F*' is

the matrix of factors

a_{ij}isthenetcorrelationbetweenj^{th}factorandi^{th}observedvariable '*n*' is

the number of variables

'*m*'isthenumberoffactors

'*N*'isthenumberofrespondents

Theextractionoffactorsdependsonthemagnitudeofeigenvaluesorthescreeplot.Themaximum numberoffactorsthatcouldbeextractedisequaltothenumberofvariablesconsideredinthestudy.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 componentmethodforextractionoffactors.Withtheconceptionthatperceptionregarding 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 differentstatementsunderthreecomponentsthroughfive-pointcontinuum.Thesampleadequacyisapre- requisite for factor analysis, tested using Kaiser-Meyer-Olkin (KMO). If the obtained KMO value is greater than0.6thenitindicatesthatthesampleisadequatetodrawmeaningfulinferencesoutoffactoranalysis. 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) wasnomenclated.Thenomenclatureoflatentfactorishighlysubjectiveitpurelydependsontheingenuity of the researcher and expertise in the subject.

3. RESULTSAND 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 PerceptiontowardsObjectivesofCHSC

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 enablefarmers toexecutetasks efficiently and promptly.Timely completionofoperations such as sowing, cultivation, and harvesting is crucial for maximizing crop yields and optimizing farm productivity. Customhiringservicecentersfacilitatethisbyofferingfarmerstheresourcesneededtoadheretoseasonal 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 withminimum 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 PerceptiontowardsAvailabilityofServicesinCHSC

Itisnoteworthythatthestatement"RepairsofthemachineryaredoneinCHSC"holdsthetopposition, 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 amongfarmers,furthersolidifyingtheirpositionasindispensablepartnersinmodernagriculturalpractices, where dependable machinery maintenance is essential for sustaining farm operations. Following closely, thestatement"ModernmachineryisavailableinCHSC"securesthesecondrankwitharespectablemean score of 4.45, this reflects their commitment to offering state-of-the-art equipment and ensures farmers accesstoefficientandadvancedtechnology,enhancingproductivityandoutputquality.Demonstratingthe CHSC's profound impact, the third rank in this category is secured by the statement "The pre-booking servicefacility is available" with anoteworthy meanscoreof 4.33,the pre-bookingservicefacility 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 PerceptiontowardsbenefitsofCHSC

Thetop-rankedstatement,"Thefarmerpaysonlyforthenumberofacresorthenumberofhoursused" with a mean score of 4.76, this exemplifies the financial flexibility and efficiency offered by Custom Hiring Service Centers (CHSCs).This system allows farmers to minimize costs by paying solely for the services utilized, eliminatingtheneedfor upfrontcapitalinvestment inmachinery. It also ensures equitable pricing, particularly beneficial for small-scale and marginal farmers with limited resources. By embracing this paymentapproach,CHSCsempowerfarmerstoaccessmodernagriculturalequipmentwithoutthefinancial burden of ownership, promoting sustainable and inclusive agricultural practices while enhancing overall farmprofitability.Additionally,thesecond-rankedstatement,"Thereisaprovisionofusingmachinesasper therequirement of booking"with a mean scoreof 4.49,this underscores theflexibility and tailoredservice offerings of Custom Hiring Service Centers (CHSCs) which ensures that farmers can access the specific machineryneededfortheiroperations,optimizingresourceutilizationandenhancingoperationalefficiency. Furthermore,thethird-rankedstatement,"Thereisnoneedforthefarmersforlongtermcapitalinvestment inthemachine"withameanscoreof4.47,thisreflectsthefinancialadvantageandriskmitigationafforded

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.

Table1:Statementwisedistributionoffarmerswithrespecttoperceptiontowardsusefulnessof custom hiring service centres

(n=130)

Sl. No.	Statements	Mean score	Rank
A	**PerceptiontowardsobjectivesofCHSC**		
1	Overcometheproblemoflabourinagriculturaloperations	4.70	I
2	Helpstomaintaintimelinessinanagriculturaloperation	4.55	II
3	Farmmachineryisavailableatareasonablecostforsmalland marginal farmers	4.11	V
4	FarmmachineryatCHSCattractsruralyouthtowardsagriculture	3.33	VIII
5	Helpstocarryoutsowingontimewithminimumlabour	4.31	III
6	Helpstocarryouttheinterculturaloperationsontime	4.29	IV
7	Harvestingwithmachineswillhelptoreducethewastagein production	3.88	VI
8	TimelyuseofsprayersforIPMpracticewillhelpinthecontrolof pestanddisease	3.48	VII
B	**PerceptiontowardsavailabilityofservicesinCHSC**		
1	ModernmachineryisavailableinCHSC	4.45	II
2	Thepre-bookingservicefacilityisavailable	4.33	III
3	Expertdriversandoperatorsareavailable	3.81	V
4	Qualityserviceisavailable	3.87	IV
5	Visitingfarmersfieldaftercompletionofthework	1.21	VI
6	RepairsofthemachineryaredoneinCHSC	4.72	I
C	**PerceptiontowardsbenefitsofCHSC**		

1	Thereisnoneedforthefarmersforlongtermcapitalinvestment inthemachine.	4.47	III
2	Hiringfarmerhasnoresponsibilityforoperatingthemachine.	4.42	IV
3	Thefarmerpaysonlyforthenumberofacresor thenumberof hoursused.	4.76	I
4	Machinerywhichisgivenforhiringismostlyingoodcondition.	4.06	VII
5	Improvesthequalityofwork.	4.10	V
6	Maintaintimelinessofagriculturaloperation.	3.95	IX
7	Customhiringoffarmmachineryandimplementswillreducethe costofcultivation.	4.05	VIII
8	Customhiringmakestimelyavailabilityoffarmmachineryand implements.	4.07	VI
9	Thereisaprovisionofusingmachinesaspertherequirementof booking	4.49	II

3.2 Componentswisedistributionoffarmerswithrespecttoperceptiontowardsusefulness of custom hiring service centres

TheTable2andFig.1providesacomprehensiveoverviewofthedistributionoffarmersindifferent 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 categoryfollowedby24.62percentinlowcategory.Thisvariabilitysuggeststhatwhileasignificantportion 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.

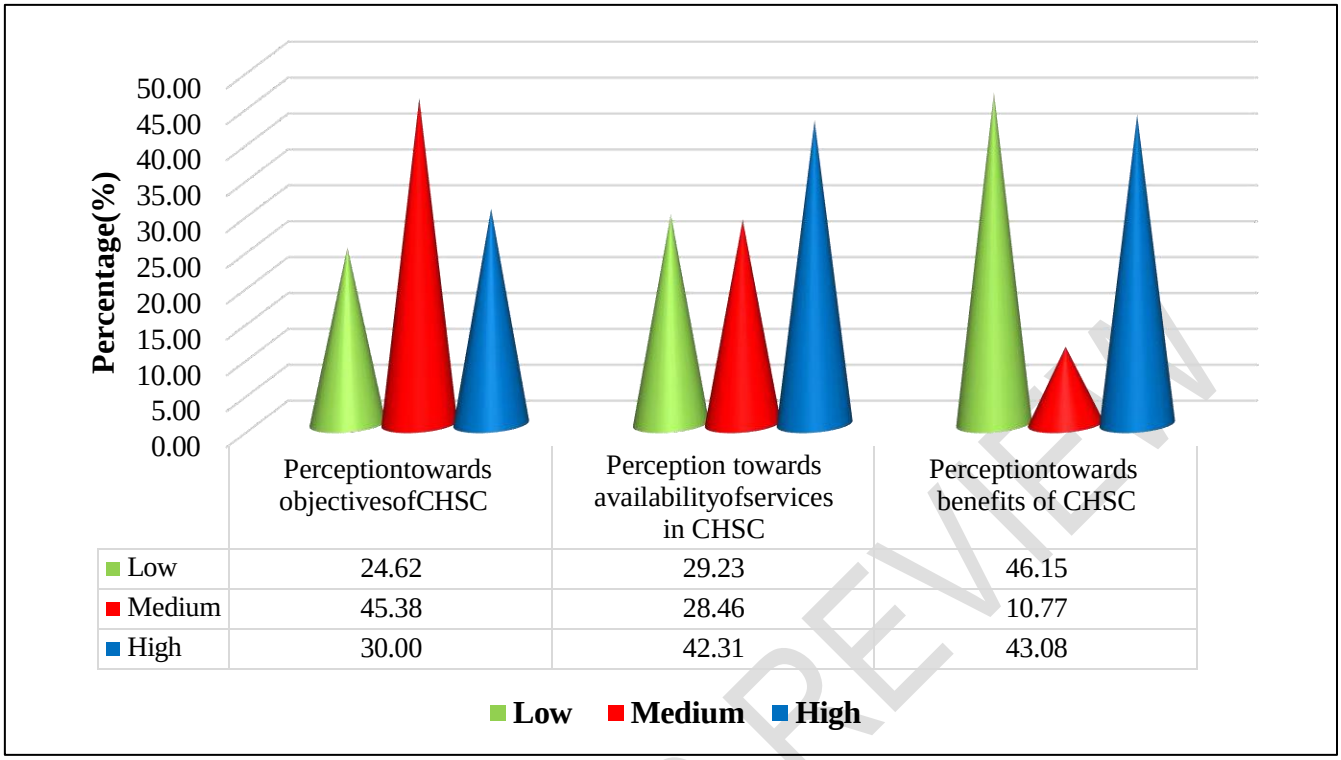
Perception towards availability of services in CHSC also saw positive outcomes through the servicesofCHSCs. With 42.13percentofrespondentsinthe highcategory and 29.23percent inthe low categoryfollowedby28.46percentinmediumcategory.Thissuggeststhatasignificantsegmentoffarmers acknowledges satisfactory access to services offered by CHSCs. To address perceptions of low service availability,CHSCscouldconsiderexpandingtheirserviceofferings,improvinginfrastructure,orenhancing 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 centofrespondents were categorizedas lowand43.08percentIthehighcategoryfollowedby10.77per cent of farmers in medium category. This highlights a segment of farmers who may not fully appreciate or recognizetheadvantagesofferedbyCHSCs.Thiscouldbeattributedtofactorssuchaslackofawareness, limited access to CHSCs, or past negative experiences and also some famers 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.

Table2:Componentswisedistributionoffarmerswithrespecttoperceptiontowardsusefulnessof custom hiring service centres

(n=130)

Sl. No.	Perceptioncomponents	Categories	f	Percent
1	PerceptiontowardsobjectivesofCHSC 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	Perceptiontowardsavailabilityof 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	PerceptiontowardsbenefitsofCHSC Mean = 38.24 SD=39.80	Low<(Mean-½SD)	60	46.15
		Medium(Mean+½SD)	14	10.77
		High>(Mean+½SD)	56	43.08



	Perceptiontowards objectivesofCHSC	Perception towards availabilityofservices in CHSC	Perceptiontowards benefits of CHSC
Low	24.62	29.23	46.15
Medium	45.38	28.46	10.77
High	30.00	42.31	43.08

Fig1:Componentswisedistributionoffarmerswithrespecttoperception towardsusefulnessof custom hiring service centres

3.3 Overallperceptionoffarmerstowardsusefulnessofcustomhiringservicecentres

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 scoreof93.43indicatesagenerallypositiveoutlooktowardsCHSCsamongrespondents.Thedistribution acrosscategoriesrevealsthatthemajorityoffarmersfallwithinthemediumandhighperceptioncategories, constituting33.08%and36.15%ofrespondents,respectively.Thissuggeststhatasignificantproportionof 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 notfullyrecognizeorappreciatethebenefitsofferedbythesecenters.Addressingtheconcernsandneeds 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 supportingsustainableagriculture.Overall,understandingfarmers'perceptionsandadaptingCHSCs'

strategiesaccordinglyareessential foroptimizing theirimpact and fosteringpositive relationshipswith farming communities.

Table3:Overallperceptionoffarmerstowardsusefulnessofcustomhiringservicecentres

(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
Mean=93.43		**SD =5.82**

3.4 Factorsinfluencingperceptionoffarmerstowardsusefulnessofcustomhiringservice centres

In assessing levels of perception, it's essential to discern the underlying factors driving such perceptions.Inourstudy,weconductedfactoranalysistoidentifythekeyfactorsinfluencingtheperception towardstheobjectives,availabilityofservicesandbenefitsofCHSC.(RefertoTable4).Firstly,weevaluated 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 and1123.25, 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 componentmethodforfactorextraction.Factorsweredeterminedbasedoneigenvaluesandthescreeplot technique.Notably,thefirstfactorcontributedsubstantiallytothetotalvariation,followedbytheremaining factorsindescendingorderofmagnitude.Theseextractedfactorsrepresentlatentvariables,representing linear combinations of the different factors under study. Naming these latent variables is crucial in factor analysis, considering they represent unobserved constructs. Wecarefully describedthecontribution of each extracted factor, along with their respective names, to enhance understanding and interpretation.

3.4.1PerceptiontowardsobjectivesofCHSC

Thefirstfactorcontributed12.14percenttothetotalvariationinthedataset(Table,4)Thevariable 'overcometheproblemoflabourinagriculturaloperations'receivedhighestfactorloadingof0.76itwas

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 accessibletomodernmachineriestocarryoutparticularfieldoperationsinastipulatedtimeperiod,'Helps to carry out sowing on time with minimum labour'(0.70), 'Helps to carry out the interculturaloperations on time'(0.69) and 'Farm machinery is available at a reasonable cost for small and marginal farmers'(0.66). Thenamingoflatentvariable*i.e.,*firstfactorwasdonebasedonthevariable/shavinghighest/higherfactor loading/s. The variables which have received highest loading signals the perception towards the achievement of CHSC objectives.

3.4.2Perceptiontowardsavailabilityofservicesin 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) itwasmainlyduetomajorityofthefarmersinthestudyareabelongstosmallandmarginalcategoryhence, they can'tinvesthugecapitalonmodern machineries'as expressedby farmers in thestudy area.Andthe variable 'pre-booking service facility was available' was contributed (0.69) among the other variables analyzed under the study.

3.4.3PerceptiontowardsbenefitsofCHSC

CustomHiringServiceCenters(CHSCs)playasignificantroleinagriculturalsectors,especiallyin 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 chargeswouldn'tvarywiththedemandandtimethusfarmersareallowedtopayonlyfortheservicetaken.
Followedby 'thereis noneedfor thefarmers for longterm capital investmentinthemachineries'carries a component loading of (0.77) which was due to the fact that services of CHSC are affordable in the same lineithelpsfarmersinreducingcostofproductionadditiontothatalsohelpsinincreasinglivelihoodsecurity 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 towardsusefulness of custom hiring servicecentres

(n=130)

Sl. No.	Statements	Component loadings
A	**Factor1:PerceptiontowardsobjectivesofCHSC**	
1	Overcometheproblemoflabourinagriculturaloperations	0.76
2	Helpstomaintaintimelinessinanagriculturaloperation	0.75
3	Farmmachineryisavailableatareasonablecostforsmallandmarginal farmers	0.66
4	FarmmachineryatCHSCattractsruralyouthtowardsagriculture	0.18
5	Helpstocarryoutsowingontimewithminimumlabour	0.70
6	Helpstocarryouttheinterculturaloperationsontime	0.69
7	Harvestingwithmachineswillhelptoreducethewastageinproduction	0.55
8	TimelyuseofsprayersforIPMpracticewillhelpinthecontrolofpestand disease	0.32
	Percentofvariance	23.58 %
	Kaiser-Mayer-OlkinMeasureofSamplingAdequacy	0.71
	Bartlett'stestofSphericity(Chisquarevalue) (*P*-value = 0.001)	1216.38***
B	**Factor2:PerceptiontowardsavailabilityofservicesinCHSC**	
1	ModernmachineryisavailableinCHSC	0.71
2	Thepre-bookingservicefacilityisavailable	0.69
3	Expertdriversandoperatorsareavailable	0.61
4	Qualityserviceisavailable	0.58
5	Visitingfarmersfieldaftercompletionofthework	0.51
6	RepairsofthemachineryaredoneinCHSC	0.77
	Percentofvariance	25.90 %
	Kaiser-Mayer-OlkinMeasureofSamplingAdequacy	0.68
	Bartlett'stestofSphericity(Chisquarevalue) (*P*-value = 0.001)	844.59***
C	**Factor3:PerceptiontowardsbenefitsofCHSC**	
1	Thereisnoneedforthefarmersforlongtermcapitalinvestmentinthe machineries.	0.77
2	Hiringfarmerhasnoresponsibilityforoperatingthemachine.	0.66

3	Thefarmerpaysonlyforthenumberofacresorthenumberofhoursused.	0.83
4	Machinerywhichisgivenforhiringismostlyingoodcondition.	0.31
5	Improvesthequalityofwork.	0.35
6	Maintaintimelinessofagriculturaloperation.	0.59
7	Customhiringoffarmmachineryandimplementswillreducethecostof cultivation.	0.43
8	Customhiringmakestimelyavailabilityoffarmmachineryandimplements.	0.64
9	Thereisaprovisionofusingmachinesasperthe requirementofbooking	0.72
	Percentofvariance	21.89 %
	Kaiser-Mayer-OlkinMeasureofSamplingAdequacy	0.72
	Bartlett'stestofSphericity(Chisquarevalue) (*P*-value = 0.001)	1123.25***

4. CONCLUSION

Farm mechanization holds immense potential to catalyze agricultural transformation in India, offering a pathwaytowards enhancingfarm productivity,improving livelihoods, andensuring foodsecurity inthefaceofevolvingglobalchallenges.Despitesignificantprogress,challengesremaininthewidespread 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, particularlyamongsmallandmarginalfarmers.CustomHiringServiceCentre'shaveemergedas instrumental facilitators in the agricultural landscape of India, particularly in addressing the mechanization needsofsmallandmarginalfarmers.Throughtheprovisionofaffordableaccesstoadiverserangeoffarm 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 ofruralcommunities.Movingforward,sustainedefforts tostrengthenand expandthecustom hiring centers networkwillbeessentialinharnessingthefullbenefitsofagriculturalmechanizationandrealizingthevision of a prosperous and sustainable agrarian economy in India.

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