Original Research Article

Perception vs. Performance: Correlation Assessment of Custom Hiring Centres in the Era of Climate-Smart Agriculture

ABSTRACT

Farm mechanization is crucial for boosting land productivity by ensuring timely and precise agricultural operations, reducing crop loss, increasing labor efficiency, and enhancing the quality of farm work. However, small and marginal farmers often cannot afford the necessary equipment due to their poor economic conditions. Custom Hiring Centers (CHCs) provide a solution by offering affordable access to farm implements, addressing labor shortages, ensuring efficient operations, and increasing yields by sharing the cost of implements through 'innovative arrangements'.An ex-post facto research design was used in present investigation. The study was confined to Vijayapur district of Karnataka. From this district, five hoblis (seven CHCs) were purposively selected with 140 respondents.The study is all about the relationship between the efficiency of CHSC & farmers' profile of Vijayapur district, Karnataka. The study involved fifteen independent variables and one dependent variable. Data were gathered using structured interview schedules through personal interviews and analyzed using correlation coefficients. The result obtained might help to explore and widen the scope of farm mechanization and can help unleash the complete potential of custom hiring services, benefiting farmers and the agricultural domain alike.

Key words: Mechanization,Implements, Custom HiringCenters (CHCs), Efficiency,Correlation Analysis

1. Introduction

Agriculture serves as the cornerstone of the Indian economy, serving as the primary livelihood for a significant portion of the population. During the period of 2022-23, agriculture contributed approximately 15% to the Gross Value Added (GVA) of the overall economy, with a growth rate averaging 4.3% over the past six years. Of India's total land area, approximately 139.4 million hectares are utilized for cultivation. A vast number of rural households rely on agriculture, with approximately 82% of farmers categorized as small and marginal, and 54.3% of the workforce engaged in agriculture and related sectors.

Labor shortages and dwindling draft animal populations have made timely agricultural operations increasingly difficult, leading to higher wages and lower productivity. Farm mechanization emerges as a solution, promising timely and precise operations, minimizing crop loss, and optimizing labor efficiency. Yet, the affordability of necessary machinery poses a challenge, particularly for small and marginal farmers. Custom Hiring Centers (CHCs) present a viable solution by offering access to farm machinery at affordable rates.

Custom hiring of farm mechanization made its debut in Indian agriculture during the 19th century, with the introduction of custom hiring services dating back to 1912 in Punjab, where a steam thresher was employed (Srinivasarao et al., 2013). In 1971, the Government of India initiated a nationwide scheme to establish agro services centers, significantly promoting custom hiring services. Although custom hiring received attention under schemes like the National Agriculture Technology Project (NATP) and the National Agricultural Innovation Project (NAIP), its prioritization remained limited. In 2014, the Department of Agriculture, Government of Karnataka proposed the establishment of 186 Custom Hiring Service Centers (CHSCs), to be operated by two private entities. The Shri KshethraDharmasthala Rural Development Project, a charitable trust associated with the administrator of Dharmasthala temple in

Dakshina Kannada, and the Indian Society of Agribusiness Professionals, New Delhi, are already operating 161 and 17 centers, respectively. In Vijayapur district, custom hiring services are available at seven centers across five taluks (Vijayapur, BasavanBagewadi, Sindagi, Indi, and Muddebihal) at the hobli level. These services in Vijayapur district are provided by the social and human resource organization Kala ChetanaYuvaSamasthe.

This paper discusses& explores the relationship between the efficiency of CHCs and farmers' profile in the study area. This study would facilitate enhancing the suitability of CHC services for farmers, the role of mechanization in current farming practices, and potential these government and non-government institutions hold to improve CHC accessibility to farmers.

2. Materials and Methods

The present study was conducted in Vijayapur district of Karnataka. Vijayapur district was purposively selected for the study as Custom Hiring Service Centers were implemented in all the five taluks of Vijayapur district i.e. Vijayapur, Indi, BasavanaBagewadi, Muddebihal and Sindagi. *Ex-post facto* research design was employed,since the phenomenon had already occurred and the design was considered appropriate. All these taluks were selected purposively, as in all these taluks custom hiring service centers were started at hobli level. By using proportionate random sampling procedure, numbers of respondents were selected. Thus total sample size constituted for the study was 140 farmers from each hobli (CHSCs). The selected farmers were interviewed and desired information was collected with the help of predesigned and pre-tested schedule. The 15 variables *viz.*, age, gender, education, farm size, farming experience, social participation, management orientation, annual family income, accessibility, innovativeness, extension contact, mass media exposure, attitude , achievement motivation and economic orientation for the present study have been selected on the basis ofdiscussing formally and informally extension experts, resource personnel, researchers, previous studies taken up on the related subjects and followed the available reviews obtained. Only those variables, which were having most relevance to the present investigation, were selected for the study.The data collected were scored, tabulated, and analyzed by using statistical tool such as correlation coefficient.

3. Results and discussion

To examine the relationship between the selected independent variables and the efficiency of CHSC, correlation coefficients (r) were calculated. The results are presented in Table 1. The relationship between the scores of selected independent variables and the efficiency of the custom hiring centres was tested using both the null hypothesis and the empirical hypothesis.

Null hypothesis

There will be no significant relationship between the selected independent variables viz., age, gender, education, farm size, farming experience, social participation, management orientation, annual family income, accessibility, innovativeness, extension contact, mass media exposure, attitude, achievement motivation and economic orientation and the efficiency of custom hiring centres.

Empirical hypothesis

There will be significant relationship between the selected independent variables viz., age, gender, education, farm size, farming experience, social participation, management orientation, annual family income, accessibility, innovativeness, extension contact, mass media exposure, attitude, achievement motivation and economic orientation and the efficiency of custom hiring centres.

The findings from the current study and subsequent discussions regarding relationship between the selected independent variables and the efficiency of CHSC have been summarized under the following headings**:**

UNDER PEER REVIEW

Efficiencyvs. age

The data presented in Table 1 shows that the computed coefficient of correlation (‘r’ = 0.028) between age and the efficiency of custom hiring centers in the study area is less than the table value of ‘r’ at the 0.05 level of significance. Consequently, the null hypothesis was accepted, and the empirical hypothesis was rejected. Thus, it can be concluded that there is a positive but non-significant relationship between age and the efficiency of custom hiring centers.

The findings suggested that the efficiency of the custom hiring centers was not influenced by the age of the respondents. A possible reason for this outcome could be that, regardless of the respondent's age, individuals learn mechanization technologies, which in turn affects the efficiency of the custom hiring centers.

Efficiencyvs. gender

The results in Table 1 showed that the coefficient of correlation (‘r’= 0.059) between gender and the efficiency of custom hiring centers was below the table value of ‘r’ at the 0.05 level of significance. Therefore, the null hypothesis was accepted, and the empirical hypothesis was rejected. This indicates that there is a positive but non-significant relationship between gender and the efficiency of custom hiring centers.

The results indicated that the efficiency of custom hiring centers was not influenced by the gender of the respondents. This could be because, regardless of gender, individuals learn the technologies related to mechanization, which affects the efficiency of custom hiring centers.

Efficiencyvs. education

From Table1, it is evident that the computed coefficient of correlation value (r = 0.188) between education and the efficiency of custom hiring centers was greater than the table value of ‘r’ at the 0.05 level of significance. Hence, the null hypothesis was rejected and the empirical hypothesis was accepted. Therefore, it can be inferred that there was a positive and significant relationship between education and the efficiency of custom hiring centers.

The probable reason for this trend might be that education significantly enhances the respondents' cognitive abilities. Educated farmers, with moderate exposure to mass media, can access various sources of farm information such as magazines, bulletins, and extension publications on agriculture. They are also more likely to approach extension agencies, scientists, research stations, and KVKs to obtain information on farm mechanization, which positively influences the overall efficiency of custom hiring centers.

Efficiencyvs. farm size

The data presented in Table 1 reveal that the coefficient of correlation (r = -0.163) between farm size and the efficiency of custom hiring centers is less than the critical value of ‘r’ at the 0.05 significance level. Consequently, the null hypothesis was accepted, and the empirical hypothesis was rejected.

Therefore, it can be inferred that there is a negative and non-significant relationship between farm size and the efficiency of custom hiring centers. This trend indicates that small and marginal farmers have better accessibility to custom hiring centers, as these centers primarily focus on serving smaller farming operations.

Efficiencyvs. farming experience

The results in Table 1 show that the computed coefficient of correlation ('r' = 0.005) between farming experience and the efficiency of custom hiring centers was less than the table value of 'r' at the 0.05 level of significance. Consequently, the null hypothesis was accepted, and the empirical hypothesis was

UNDER PEER REVIEW

rejected. Therefore, it can be inferred that there is a positive but non-significant relationship between farming experience and the efficiency of custom hiring centers.

The results indicated that the efficiency of the custom hiring centers had no influence on the farming experience of the respondents. The likely reason for this outcome is that middle-aged respondents with moderate farming experience tend to favor farm mechanization due to labor scarcity, which in turn affects the efficiency of custom hiring centers.

Efficiencyvs. social participation

From Table 1, it is evident that the coefficient of correlation (r = 0.208) between social participation and the efficiency of custom hiring centers was greater than the table value of ‘r’ at the 0.01 level of significance. Hence, the null hypothesis was rejected and the empirical hypothesis was accepted. Therefore, it can be inferred that there is a positive and significant relationship between social participation and the efficiency of custom hiring centers.

One potential explanation could be that farmers who hold memberships in one or more organizations have opportunities for interaction and the exchange of ideas regarding activities associated with farm mechanization. This interaction likely contributes to the influence observed on the efficiency of custom hiring centers.

Efficiencyvs. attitude

The correlation coefficient (r = 0.381) between attitude and the efficiency of custom hiring centers exceeded the table value of ‘r’ at the 0.01 level of significance, as evident from Table 1. Thus, the null hypothesis was rejected, and the empirical hypothesis was accepted. This implies a positive and significant relationship between accessibility and the efficiency of custom hiring centers.

The probable reason could be that custom hiring allows for the optimal utilization of new machinery and provides farmers with access to cutting-edge technology that may otherwise be financially out of reach. Additionally, it plays a crucial role in facilitating agricultural diversification, particularly from traditional crops like wheat and paddy to other agricultural commodities.

Efficiencyvs. annual family income

The analysis from Table 1 reveals that the correlation coefficient (r = 0.223) between annual income and the efficiency of custom hiring centers exceeds the critical value of ‘r’ at the 0.05 significance level. Consequently, the null hypothesis is rejected, and the empirical hypothesis is accepted. This suggests a positive and significant relationship between annual income and the efficiency of custom hiring centers.

Mechanization in farming facilitates timely agricultural operations, leading to increased profitability for farmers. Consequently, the enhanced income directly impacts the efficiency of custom hiring centers.

Efficiencyvs. management orientation

The analysis from Table 1 revealed a correlation coefficient (r = 0.236) between management orientation and the efficiency of custom hiring centers, surpassing the critical value of 'r' at the 0.01 significance level. Consequently, the null hypothesis was rejected, affirming the empirical hypothesis and indicating a positive and significant relationship between management orientation and the efficiency of custom hiring centers.

Customers utilizing custom hiring centers demonstrated superior management orientation, particularly in planning and implementing crop production technologies involving mechanization. This aspect positively impacted the enhanced efficiency of custom hiring centers.

UNDER PEER REVIEW

Efficiencyvs. accessibility

The correlation coefficient (r = 0.241) between accessibility and the efficiency of custom hiring centers exceeded the table value of ‘r’ at the 0.01 level of significance, as evident from Table 1. Thus, the null hypothesis was rejected, and the empirical hypothesis was accepted. This implies a positive and significant relationship between accessibility and the efficiency of custom hiring centers.

The likely explanation is that a significant portion of the respondents have enhanced accessibility to the custom hiring centers, as these centers serve the requirements of users from neighboring villages within a 5-7 kilometer radius from their location. This scenario contributes to the improved efficiency of the CHCs.

Efficiencyvs.innovativeness

The analysis from Table 1indicates a correlation coefficient (r = 0.265) between innovativeness and the efficiency of custom hiring centers, surpassing the critical value of 'r' at the 0.01 significance level. Consequently, the null hypothesis was rejected in favor of the empirical hypothesis. Thus, it can be inferred that there exists a positive and significant relationship between innovativeness and the efficiency of custom hiring centers.

A person with a high level of innovativeness tends to actively seek out new technologies associated with farm mechanization, which ultimately impacts the efficiency of custom hiring centers.

Efficiencyvs.extension contact

The data from Table 1 clearly demonstrate a coefficient of correlation (r = 0.295) between extension contact and the efficiency of custom hiring centers, exceeding the table value of ‘r’ at the 0.01 level of significance. Consequently, the null hypothesis was rejected, and the empirical hypothesis was accepted. Thus, it can be concluded that there exists a positive and significant relationship between extension contact and the efficiency of custom hiring centers.

Farmers who engage with extension functionaries can access reliable information. Consequently, users of custom hiring centers who have more extension contact tend to exert a greater influence on the efficiency of these centers.

Efficiencyvs.mass media exposure

The data from Table 1 indicate a correlation coefficient (r = 0.249) between mass media exposure and the efficiency of custom hiring centers, surpassing the table value of ‘r’ at a 0.01 level of significance. Consequently, the null hypothesis was rejected, and the empirical hypothesis was accepted. This suggests a positive and significant relationship between mass media exposure and the efficiency of custom hiring centers.

The observed outcome could be attributed to the consistent exposure to mass media, which enables individuals to acquire information on the latest technologies related to farm mechanization. Consequently, an enhanced efficiency of custom hiring centers was noted.

Efficiencyvs.economic orientation

The results depicted in Table 1highlight a correlation coefficient (r = 0.278) between economic orientation and the efficiency of custom hiring centers, surpassing the table value of 'r' at the 0.01 level of significance. Consequently, the null hypothesis was dismissed, while the empirical hypothesis was upheld. Thus, it can be deduced that there exists a positive and significant relationship between economic orientation and the efficiency of custom hiring centers.

UNDER PEER REVIEW

The observed outcome could be attributed to farmers with a higher economic orientation striving for enhanced yields and improved returns. This inclination motivates respondents to embrace the latest technologies pertinent to farm mechanization, thereby establishing a positive and significant relationship with the efficiency of custom hiring centers.

Efficiencyvs.achievement motivation

The data presented in Table 1reveal a correlation coefficient (r = 0.259) between achievement motivation and the efficiency of custom hiring centers, surpassing the table value of 'r' at the 0.01 level of significance. Consequently, the null hypothesis was dismissed, while the empirical hypothesis was upheld. Hence, it can be inferred that there exists a positive and significant relationship between achievement motivation and the efficiency of custom hiring centers.

The noted result can be attributed to the inherent drive of achievement motivation, compelling individuals to strive toward goals and acquire knowledge of the latest technologies. This motivation consequently exerts a positive influence on the efficiency custom hiring centers.

The studies were supported by the findings of Vanetha &Senthil(2013), Srinivasrao*et al.* (2013), Hiremath *et al.* (2015), Sampathkumar (2014) Chandrashekar (2016) Kohisatani*et al*. (2018) and Rajyalakshmi (2019), Kisku & Singh (2022).

UNDER PEER REVIEW

Table 1. Correlation analysis of profile characteristics and the performance of custom hiring centres

(n=140)

Variable No.	Independent variables	Correlation coefficients ('r' values)
X1	Age	0.028NS
X2	Gender	0.059NS
X3	Education	0.188 *
X4	Farm size	-0.163NS
X5	Farming experience	0.005NS
X6	Social participation	0.208**
X7	Attitude	0.381**
X8	Annual family income	0.223*
X9	Management orientation	0.236*
X10	Accessibility	0.241**
X11	Innovativeness	0.265**
X12	Extension contact	0.295**
X13	Mass media exposure	0.249**
X14	Economic orientation	0.278**
X15	Achievement motivation	0.259**

* : Significant at 0.05 level
** : Significant at 0.01 level
NS : Non-significant

4. Summary and Conclusions

In summary, correlation analysis indicated that certain independent variables, such as, education, social participation, attitude, management orientation, annual family income, accessibility, innovativeness, extension contact, mass media exposure, attitude , achievement motivation and economic orientation, exhibited a positive and significant relationship with the adoption of recommended maize cultivation practices. Conversely, farm size showed a negative and significant relationship, while age, gender, farming experience demonstrated a non-significant relationship with the adoption extent. Therefore, emphasis should be placed on enhancing those independent variables that positively and significantly correlate with the efficiency of custom hiring centres.

UNDER PEER REVIEW

5. References

1. Chandrashekar G. A study on perceived need of custom hiring of farm machineries in Hassan district of Karnataka. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Bengaluru, Karnataka (India). 2016.
2. Dash RC, Sirohi NPS, Tyagi KK. Farm power and machinery availability and utilization: A case study of Karnal district (Haryana). Agric Eng Today. 2004;28(1-2):32-8
3. Hiremath GM, Lokesh GB, Maraddi GN and Suresh SP. Accessibility of farm machinery services - CHSCs for small and marginal farmers. *Int. J. Manage. Soc. Sci.,* 2015; 3(2):897-907.
4. Jyoti NG. Farm mechanization expectations of cotton growers. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad, Karnataka (India). 2012
5. Kisku U, Bisht K. Custom hiring services availed, constraints and suggestions perceived by the farmers in Jabalpur District of Madhya Pradesh. Asian Journal Of Agricultural Extension. Econ Sociol. 2022;40(7):64-9
6. Kisku, U. & Singh, A. K. (2022). A Review on Custom Hiring Services under Indian Conditions: Farmer's Perception, Associated Factors, Constraints, and Suggestions. *Asian Journal of Agricultural Extension, Economics & Sociology*, *40*(11), 8–27.
7. Kohisatani, Tamana, Prasad, S.V., Thomas, Blessy T. and Karrimi, Abdul Shakoor (2018).Correlation analysis between profile characteristics of maize farmers and their extent of adoption of recommended package of practice of maize in Mahmud I Raqi district of Kapisa a province of Afghanistan. Agric. Update, 13(3): 310-315; DOI : 10.15740/HAS/AU/13.3/310-315
8. Rajyalakshmi MB. A Study On Performance Of Custom Hiring Centres in Chittoor District Of Andhra Pradesh. *M. Sc. (Agri.) Thesis*, Acharya N.G. Ranga Agricultural University, Andhra Pradesh (India). 2019
9. Sampathkumar M. A study on agricultural mechanization in Karimnagar district of Andhra Pradesh. *M.Sc. (Agri.) Thesis*, Acharya N. G Ranga Agricultural University, Hyderabad (India). 2014
10. Shoba H, Rajeshwari N, Yogeeshappa H. A study on farm mechanization level of farmers in North Karnataka, India. Int JCurrMicrobiolAppl Sci. 2018;7(2):652-7.
11. Singh S, Kingra HS, Sangeet. Custom Hiring Services of Farm Machinery in Punjab: Impact and Policies Indian Research Journal. Extension Education. 2013;13(2):45- 50.
12. Srinivasarao C, Dixit S, Srinivas I, Reddy BS, Adake RV and Borkar S, Operationalization of custom hiring centers on farm implements in hundred villages in India. Central Research Institute for Dryland Agriculture, Hyderabad, Andhra Pradesh. 2013;2(2):88-91.
13. Vanetha K, Senthil A. A study on profile of farmers in utilization of farm equipments in Tamil Nadu. Int J Adv Res. 2013;1(5):284-8
14. Vanetha KP. Utilization behavior of farm equipment in commercial crops. Topical Research, AC&RI. Coimbatore: Tamil Nadu Agricultural University; 2006.