



Research Article

AN ANALYSIS OF FINANCIAL FEASIBILITY OF ESTABLISHING CUSTOM HIRING CENTRES - A CASE STUDY IN COIMBATORE DISTRICT OF TAMIL NADU

V. KOWSALYA*, K. MAHENDRAN, S. HEMALATHA AND S. MOGHANA LAVANYA

Department of Agriculture and Rural Management, Tamil Nadu Agricultural University, Coimbatore, 641003, Tamil Nadu, India

*Corresponding Author: Email - vkowsalya6797@gmail.com

Received: January 01, 2021; Revised: January 25, 2021; Accepted: January 26, 2021; Published: January 30, 2021

Abstract: The custom hiring centre (CHC) plays a useful role in providing machineries to small and marginal farmers to carry out farming operations in shorter period. This study is confined to a CHC in Thondamuthur block of Coimbatore district. Primary data was collected from CHC using structured questionnaire and breakeven analysis was used to assess the financial viability of CHC. The results indicated that the CHC was financially viable. The BEP analysis revealed that rotavator followed by tractor and reversible plough generated maximum profit to the CHC. The cultivator did not generate sufficient revenue to cover the cost of initial investment. It was observed that the return on investment from machinery and implements depended on the machinery's annual usage rather than its initial cost. CHC should provide machinery and implement based on the nature of crops prevailing in the region. The results also indicated that the subsidy provided by the government plays a critical role in generating sufficient returns on investment.

Keywords: Mechanization, Financial Viability, Custom Hiring Centre (CHC) and Break-even Point (BEP)

Citation: V. Kowsalya, et al., (2021) An Analysis of Financial Feasibility of Establishing Custom Hiring Centres - A Case Study in Coimbatore District of Tamil Nadu.

International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 13, Issue 1, pp.- 10563-10565.

Copyright: Copyright©2021 V. Kowsalya, et al., This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Academic Editor / Reviewer: Dr Vipul N Kapadia

Introduction

Agriculture remains as a key sector in the contribution to employment and the development of livelihoods. Agriculture is the primary source of livelihood for some 58% of India's population and continues to serve as the backbone of rising economy. Indian agriculture is increasingly shifting from reliance on animal power to human power and dependent on machine power to a greater extent. The farm production needs agricultural machinery and implements to complete the farm work at right time. Mechanization plays a crucial role in increasing agricultural production. Usage of Farm machinery not only provides stimulus to agricultural growth, rather enhances the economic standard of farmers. The main drawbacks in agriculture are the non-availability of human labour, delayed operations and the resultant lower productivity. The redressal to these problems is leading towards the usage of farm machinery. The land ownership structure in India, especially Tamil Nadu state, are largely fragmented mainly comprising small and marginal farmers. Only 10% of farmers are big farmers and is not feasible for small and marginal farmers to own machineries. The remedy to address this lies in the establishment of Custom Hiring Centers to envisage economies of scale and reduce the cost of production. The government of Tamil Nadu had allocated a sum of Rs.16 crores for establishment of 200 CHCs during 2016-17 by the Department of Agricultural Engineering. Therefore, in order to make farm machinery accessible within the scope of small/marginal holdings, Custom Hiring Centers needs to be promoted in a wider way. The farm power availability prevailing and future requirements in Tamil Nadu state are given below:

Table-1 Farm Power Availability and Future Requirement for Mechanization

State	Farm Power Availability (kW/ha)		
	2016-17	2022*	2030*
Tamil Nadu	2.91	3.72	6.46

Availability of farm power for performing different farm operations should be increased from the present level of 2.91 kW/ha to about 3.72 kW/ha and 6.46 kW/ha in the years 2022 and 2030 respectively for meeting the requirements of enhanced farm production and improved income of farmers.

Review of Literature

Vaja et al., (2016) [1] in his study on Custom Hiring Centres (CHCs) in Junagadh district of Gujarat state revealed the importance of custom hiring during tillage operations, seed bed preparation, sowing and harvesting. This study concluded that return on investment for a machine does not depend on its initial investment. It mainly depended on the annual usage of the machine. Kumar et al., (2017) [2] conducted a study on break-even analysis of custom hiring service centres in Karnataka for analyzing the feasibility of CHCs. The primary data for the study were collected from custom hiring service providers and farmers. This study concluded that all the machineries were used profitably and there was a scope for further improvement. Kadhim et al., (2018) [3] in their study on break-even analysis for hiring decisions of agricultural mechanization services in Iraq, conducted a survey and information were collected from hiring service centres and farmers. The main objective of the study was to estimate the number of area units that were needed to cover total fixed cost of machinery and implements by using break even analysis. Results showed that 67.40, 6.50 and 55.30 hectares for tractor, rotavator and combined harvester respectively was needed to cover the total fixed cost of machinery and implements. Chinnappa et al., (2018) [4] analyzed the economic impact of custom hiring service centres in Karnataka to overcome the problem of labour scarcity. The government of Karnataka adopted the concept of Custom Hiring Centres (CHCs) in 2014. This study was conducted to examine the economic performance and economic benefits of farmers in terms of reduced cost of cultivation and increased profit. This study concluded that farmers gained 24% of additional profit and saved cost of 15.71% per acre by availing services from custom hiring centres. Kinga and Chetem (2019) [5] conducted a study on economic analysis of Custom Hiring Centre (CHC) for different farm machineries in Bhutan. This study stated that operational cost of farm machineries included both fixed and variable cost. Cost, return and break-even point of different farm machineries were needed for concluding that the hiring services was a profitable business. Their study revealed that tractors and mini combine harvester made a huge profit compared to other machineries.

Table-2 Investment made by the Custom Hiring Centre (CHC) in 2020

SN	Machineries and implements	Year of Purchase	Total Cost (Rs)	Subsidy Allotted (Rs)	Individual Contribution (Rs)
1	Tractor 65 HP	2020	8,05,739	3,22,296	4,83,443
2	Tractor 45 HP	2020	6,78,284	2,71,314	4,06,970
3	Tractor 40 HP	2020	6,19,071	2,00,000	4,19,071
4	Cultivator (9 Tynes)	2020	30,000	12,000	18,000
5	Rotavator (6 feet)	2020	1,15,840	35,800	80,040
6	Rotavator (5 feet)	2020	1,08,160	34,000	74,160
7	Reversible plough	2020	1,65,400	56,000	1,09,400
Total			25,22,494	9,31,410	15,91,084

Table-3 Returns generated by the CHC in 2020-2021

SN	Machineries and implements	Hiring charge/hr (Rs)	No. of hours rented out/yr	Revenue/yr (Rs)	Actual Area covered/ yr (acres)
1	Tractor	650	487.75	3,17,038	975
2	Rotavator	700	367.25	2,57,075	331
3	Reversible plough	650	64	41,600	160
4	Cultivator	600	4	2,600	8
Total			923	6,18,313	1474

Table-4 BEP Analysis of Custom Hiring Centre

Particulars	Machineries & Implements in CHC			
	Tractor	Rotavator	Reversible plough	Cultivator
1.Fixed Cost (Rs/yr)				
a. Depreciation	43509	6939	9846	1620
b. Interest on Investment	26589	4240	6017	990
c. Insurance & Taxes	2658	424	601	99
d. Rental value of land	2658	424	601	99
Total Fixed Cost (Rs/yr)	75417	12027	17066	2808
2.Variable Cost (Rs/hr)				
a. Fuel cost	240	160	160	160
b. Lubrication cost	3	2	2	2
c. Repair & Maintenance Cost	30	20	15	10
d. Labour wage	100	100	100	100
Total Variable Cost (Rs/hr)	373	282	277	272
3.Hiring Charges (Rs/hr)	650	700	650	600
4.BEP (hrs/yr)	272.8	28.8	45.8	8.6

Table-5 Performance of the CHC in 2020-2021

SN	Machinery and implements	BEP (hr/yr)	Actual hours rented out (hr/yr)	Difference (Actual Hours rented out - BEP)	Net Profit (Rs/yr)	% share of Net Profit
1	Tractor	272.8	487.7	214.9	1,39,681	36.21
2	Rotavator	28.8	367.3	338.5	2,36,913	61.43
3	Reversible plough	45.8	64	18.2	11,827	3.06
4	Cultivator	8.6	4	-4.6	-2,742	-0.7
Total			923		3,85,680	100

The review of past studies indicates the fact that there is no similar study in Tamil Nadu state to understand the economic status of CHCs. Hence this explorative study was attempted to provide a feedback to the stakeholders and the policy makers.

Material and Methods

The Thondamuthur CHC was primarily selected for the study due to availability of multi-crop environment and the use of different machineries to cover various farm operations. Primary Data was collected from the custom hiring centre using a structured questionnaire. Break Even analysis was attempted to assess the financial viability of custom hiring centre. BEP for tractor, rotavator, reversible plough and cultivator were calculated in terms of hiring hours that represented the number of units of usage required to cover the fixed and variable costs. The results are reported as profit when annual hiring hours was above BEP and loss when annual hiring hours was less than BEP. The various components for estimation of BEP are explained below.

1. Annual Fixed Cost = Depreciation + Interest on investment + Insurance + Rental value of land

i) Depreciation $D=(P-S)/L$

Where, D = Annual depreciation of machinery, P = Purchase value of a machine (Rs.), S= Salvage value (assumed 10% of the purchase amount of a machine), L= Life period of a machine 10 yrs.

ii) Interest on investment $I = ((P+S)/2) \times i / 100$

Where, I = rate of interest prevailed in the market (%), i = Annual interest rate (10% per annum for the farm machinery)

iii) Insurance and taxes $I_n = ((P+S)/2) \times i_n / 100$

Where, I_n = Rate of insurance and taxes (%), i_n = Annual insurance and taxes rate (1% per annum for the agricultural usage)

2. Variable cost = Fuel cost + Lubrication cost + Repair and maintenance cost + Labour cost.

i) Fuel cost (Rs/h) = Fuel Price (Rs/ lit) × Fuel Consumption (lit/hr)

ii) Lubrication cost = 1.5 % of Fuel cost (Rs/hr)

iii) Repair and Maintenance cost = 2.5% of Purchase price (Rs/hr)

iv) Labour wages = Labour wage per day/ total working hours per day (Rs/hr)

3. Hiring charges = Machineries and implements hiring charges (Rs/hr).

Results and Discussions

Investment made by Custom Hiring Centre (CHC)

Primary information on major machinery and implements used for rental service to farmers was obtained from custom hiring centre in Thondamuthur block of Coimbatore. The data on the investment made by the Custom Hiring Center in its establishment along with the subsidies provided by the Government of Tamil Nadu is documented in [Table-2].

[Table-2] reveals that the CHC owned a tractor, a cultivator, a rotator and a reversible plough. The subsidy allocated for the machinery and implements amounted to 40% of the total cost of the machineries and implements and the remaining amount was contributed by the investor. The total cost of establishment of CHC was Rs 25.23 lakhs out of which Rs 9.31 lakhs was provided by the government as subsidy and the remaining Rs 15.91 lakhs was the investment.

Returns generated by Custom Hiring Centre (CHC)

The returns generated by hiring out machineries and implements by the CHC was estimated using the information on hiring charges, number of hours machine was rented out and area covered during 2020-21 and the results are presented in [Table-3]. [Table-3] illustrates the revenue generated from the CHC, which was determined using the hiring charge/hr multiplied by the total number of hours each machinery and implements that were rented out in a year. The rental charges for tractor, rotator, reversible plough and cultivator charges were Rs 650/hr, Rs 700/hr, Rs 650/hr and Rs 600/hr respectively. The total revenue generated in a year was Rs.6,18,313. The major share of revenue was generated by renting out tractors and rotavator that formed about 51% and 41.5% respectively and the remaining revenue was obtained from renting out reversible plough and cultivator. The total area covered by the CHC in the year was 1474 acres. The tractor covered a major portion of about 975 acres, followed by rotavator that covered 331 acres in the year 2020.

Estimation of BEP (Break Even Point)

Break-even point of the selected Custom Hiring Centre (CHC) was calculated using Fixed cost (Rs/yr), variable cost and the hiring charges (Rs/ hr). BEP was calculated to estimate the number of hours each machinery along with implements needed to be engaged in a year to cover the total fixed cost of machinery and implements. The details of BEP for tractor, rotavator, reversible plough and cultivator are given in [Table-4]. [Table-4] illustrates that total fixed cost of tractor, rotavator, reversible plough and cultivator were Rs 75417/yr, Rs12027/yr, Rs.17066/yr, Rs.2808/yr respectively. The variable cost per hour uses in the case of tractor, rotavator, reversible plough and cultivator were Rs 373/hr, Rs 282/hr, Rs 277/hr and Rs 272/hr respectively. The BEP (hrs/yr) of tractor, rotavator, reversible plough and cultivator were estimated to be 272.80 hours, 28.80 hours, 45.80 hours and 8.60 hours respectively.

Performance of the CHC

The performance of CHC during 2020-21 was analyzed using the information on BEP (hr/yr), Actual hiring hours (hr/yr) and Net profit earned. Actual hiring hours are the total number of hours the machines and implements rented out in a year. Actual hiring hours of tractor, rotavator, reversible plough and cultivator were 487.70 hours, 367.30 hours, 64 hours and 4 hours respectively. [Table-5] shows that total actual hiring hours of machineries and implement was 923 (hrs/yr). Annual usage of tractor, rotavator and reversible plough was more than the BEP. Revenue generated through tractor, rotavator and reversible plough was 36%, 61% and 3% respectively. Annual profit or loss was calculated by using the hiring charges (Rs/hr) multiplied by the difference between actual hours rented out and the BEP. The net profit earned was Rs. 3.85 lakhs in a year. This study showed that tractors and rotators are often preferred by farmers for hiring to cover variety of operations.

Conclusion

Custom Hiring Centres have become the need of the hour to address the problem of non-availability of labour and intensification of cropping patterns. On the other hand, majority of the farmers being small and marginal their capacity to invest in machinery and implements remains far too fetched fact. Further any private investment has to be profitable for attracting interest on establishment of CHCs. Therefore, a study on the financial feasibility of establishing a CHC was analysed using the Break Even point. The results indicated that the investment generated sufficient net profit for the entrepreneur considering the fact that the CHC had been established with 40% subsidy from the government. Adjusting for the subsidy, the private investment on establishing a CHC may not be that attractive.

It is concluded that the CHC is financially viable under the current policy regime and it is suggested that a detailed agro-climatic understanding of specific locations would help in the identifying the right mix of farm machinery and implements in establishing a CHC would prove to be optimal for resulting financial feasibility.

Application of research: To analyze the financial feasibility of establishing Custom Hiring Centres (CHCs) and to provide a feedback to the stakeholders and the policy makers to rectify the existing gaps.

Research Category: Farm mechanization

Acknowledgement / Funding: Authors are thankful to Department of Agriculture and Rural Management, Tamil Nadu Agricultural University, Coimbatore, 641003, Tamil Nadu, India

****Research Guide or Chairperson of research: Dr K Mahendran**

University: Tamil Nadu Agricultural University, Coimbatore, 641003, India

Research project name or number: MSc Thesis

Author Contributions: All authors equally contributed

Author statement: All authors read, reviewed, agreed and approved the final manuscript. Note-All authors agreed that- Written informed consent was obtained from all participants prior to publish / enrolment

Study area / Sample Collection: Thondamuthur Block, Coimbatore, 641003

Cultivar / Variety / Breed name: Nil

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

Ethical Committee Approval Number: Nil

References

- [1] Vaja K.G. (2016) *International Journal of Agriculture Sciences*, 8(47), 1946-1948.
- [2] Ranjith Kumar P.S. & Jose P. (2020) *International Research Journal of Agricultural Economics and statistics*, 9(1), 141-148.
- [3] Kadhim Z.R., Man N.B., Latif I.A. and Seng K.W.K. (2018) *Ama-Agricultural Mechanization in Asia Africa And Latin America*, 49(4), 44-48.
- [4] Chinnappa B., Patil K.K.R. and Sowmya H.S. (2018) *Indian Journal of Agricultural Economics*, 73(4), 478-500.
- [5] Kinga N., & Chetem W. (2019) *SAARC Journal of Agriculture*, 17(2), 93-101.