EXPEDITION OF CUSTOM HIRING SERVICES OF FARM MACHINERY IN KANKER DISTRICT OF CHHATTISHGARH

ABSTRACT

The study has evaluated the contribution of Custom Hiring Centres (CHCs) towards improving the economic viability of farming in Kanker district of Chhattisgarh. Model of custom hiring is very useful for providing the services of farm machinery for agricultural operation such as seedbed preparation, sowing, harvesting and threshing within a short period. Study is conducted to know the economic feasibility of the custom hiring services of farm machinery in all blocks of the Kanker district. Survey was carried out through gathering the information of 30 custom hiring centres owners in addition to beneficiaries (138 cultivators) of this custom hiring centers . It was found that 38.4 % small cultivators avail the services of custom hiring centre followed by 31.88 % marginal, 15.94 % large, and 13.76 medium cultivators respectively. It was also noted that profit per investment of tractor among all the farm machinery was highest but other machinery such as rotavator, plough, cultivator, reaper, seed drill and thresher was also profitable to the farmers. Disc plough has negative value of profit per investment which indicates that these implement cause loss on the initial investment. The return on investment from machinery does not depend on its initial cost mainly but it depend upon the annual usage it. The success of the CHC in the district will help in reducing debt-burden of the farmers by bringing down costs of operations and improving economic viability of farming.

Keywords: Custom Hiring Centres, Break-even point, economic feasibility, Farm machine

Introduction

Indian agriculture is dependence on human power as well as animal power sources which gradually shifted on mechanical power sources. Farm mechanization play important role in Indian agriculture to do timely farm operations and saving labor cost. Mechanization is the important input of crop production but has some constraints and limitations for sustainable agriculture production such as high initial cost of machinery which often prohibits individual ownership especially amongst small, marginal and medium cultivators, lack of knowledge in scene of operation in addition to inadequate repair and maintenance facility which often restricts the use of farm machinery. The Custom Hiring Centers (CHCs) provide farm machineries and equipment's to cultivators on rental basis who cannot afford to purchase high-end agricultural machineries and equipment's. Custom Hiring Centers (CHS) an important mechanism through which maximum marginal and small holders to avail services of agricultural machinery. [Sidhu and Chahal, 2005] concluded that the cultivators having the land holding less that 2.8 ha are possible user of farm machinery on rental basis from custom hiring service centres. Also mentioned that bring optimal mechanization level in the state typical farm machinery decision may require choosing between owning a machine and hiring custom work. At present farm

mechanization is the need of hour in Indian agriculture for sustainable crop production. To achieve mechanization level in the Indian farms custom hiring centers (CHC) play a pivotal role in introducing innovative agricultural machinery even to marginal and small cultivators with the objective to sustainable crop production, improve quality, timeliness and precise agriculture operations. The present investigation is carried out to evaluate the economic feasibility of custom hiring model and to analyze the possibilities and prospects of increasing the farm income specially small and medium cultivators in the study.

Methodology

Primary and secondary data was collected regarding to know the status about custom hiring services of farm machinery provided to cultivators of Kanker district of Chhattisgarh and also calculate the Break Even Point of the all machinery used during agricultural operation. This information was collected from randomly selected 30 CHC owner in addition to it 138 beneficiaries in selected villages who provide service of custom hiring of various farm machinery for different operations. Interview performa was prepared to collect the data and analysis and compilation of data was done. The selection was made on the basis to provide service to cultivators that they had covering all types of operations for different type of agriculture produce such as cereals, millet and pulses in the study area.

According to Kamble and Shrivastava (2003)

Cost estimation: Farm machinery cost divided into two categories i.e. annual ownership costs and operating cost. Ownership cost occur regardless of machine use where operating cost which vary directly with the amount of machine use.

Ownership costs also known as fixed cost consists of depreciation, interest, taxes, insurance and housing and maintenance

Deprecation,

$D = (C- S)/ L$

Where,

D = Deprecation value, C= Original cost (Rs), S= Salvage value, Rs (Usually taken 10 % of the original value), L= Service life, (yr)

Interest on investment:
Interest is calculated on the average investment of the machine taking into consideration the value of the machine in first and last year. It is given by following relationship,

$I = \{ (C + S)/2\} \times r$

Where,I = Annual interest rate,

r = Rate of Interest

Insurance and taxes,

$IT = (P + S) / 2 \times In / 100$

Where,

IT = Insurance and taxes rate in per cent

P = Machine/ Implements purchase price (Rs.)

S = Selling price of the machine after its useful life (Rs)

In = insurance and taxes rate annually (1% per annum for the agricultural use)

Housing/ Shelter cost,

$H = (P + S) / 2 \times Hi / 100$

Where,

Sc = Shelter/ Hiring rate in per vent

P = Machine/ Implements purchase price (Rs.)

S = Selling price of the machine after its useful life (Rs)

Hi = Returns cost of the shelter (1per cent per annum for agricultural use)

Therefore, the estimated costs of depreciation, interest, taxes, insurance, housing/shelter are added together to find the total ownership cost.

Operating cost

Operating cost was calculated by fuel cost, repair and maintenance cost, lubricating oil cost and operator and labour cost.

Fuel cost

To actual amount spent on the purchase of fuel for tractor operation should be taken as fuel cost. Average fuel cost per hour is calculated by fuel consumption in liter per hour multiplying by fuel rate in Rs per hour.

Lubrication cost (LC)

Lubrication cost = 30 per cent of fuel cost (Rs. / h)

Repair and Maintenance cost (RMC)

Repair and maintenance cost = (5-10%) * Purchase Price (Rs. / h)

Operator cost

Operator costs can be estimated by calculated by multiplying the labor wage rate times.

Therefore, Repair and maintenance, fuel, labor and lubrication costs added tighter to calculate total operating cost

After determining the fixed cost and operating cost, the unit cost of operation found by the formula : Cu = Cf / X + Co

Where,

Cu = Unit cost of operation

Cf = Total annual fixed cost

X = Annual use in numbers of unit

Co = Operating Cost per unit

Breakeven point (B.E.P.):

Breakeven point is the point at which the total revenue is exactly equal to the total costs. At this point no profit is made and no losses are incurred. (Vaja K. G., *et al.*, 2016)

BEP = FC / {(HC-VC}

Where BEP = Breakeven point

FC = Fixed Cost, Rs. /year

HC = Returns cost, Rs/h

VC = Variable Cost, Rs. /h)

i = Type of the implement like plough, reaper etc.,

Implement Annual Use (h):

Total annual use (h) of an implement under different systems can be calculated by the total amount earned by a particular implement divided by the hiring charges of the implement or machine.

For hire out categories

Total annual use hours (TAUH) = Total annual earned by the i^{th} implement (Rs. /year)/

(Number of i^{th} implements) x (Returns cost of the i^{th} implement (Rs./h))

Where, (TAUH)i = Total annual use (h) of i^{th} implement under hiring

Results and Discussion

Classification of land holding

The category wise classification of land holders was observed from data collected through district as well as block level officers in the study area is shown in the Table 1. It was found that

marginal and small farmers constituted about 70.53 percent land followed by medium farmers accounted for 28.75 percent and large farmers constituted about 0.72 percent of the land in the study area. From surveyed cultivators it was also found that 38.4 % small cultivators avail the services of custom hiring centre followed by 31.88 % marginal, 15.94 % large, and 13.76 medium cultivators respectively as shown in fig 1. Hence small and marginal cultivators (70.28 per cent) take highest advantages of custom hiring model in the study area than large and medium cultivators in the study area.

Table.1 Category wise classification of land holders in the study area

SNo.	Category of farmers	No of farmers	Percentage (%)
1	Marginal	55212	40.38
2	Small	41225	30.15
3	Medium	39309	28.75
4	Large	990	0.72
	Total	136736	100

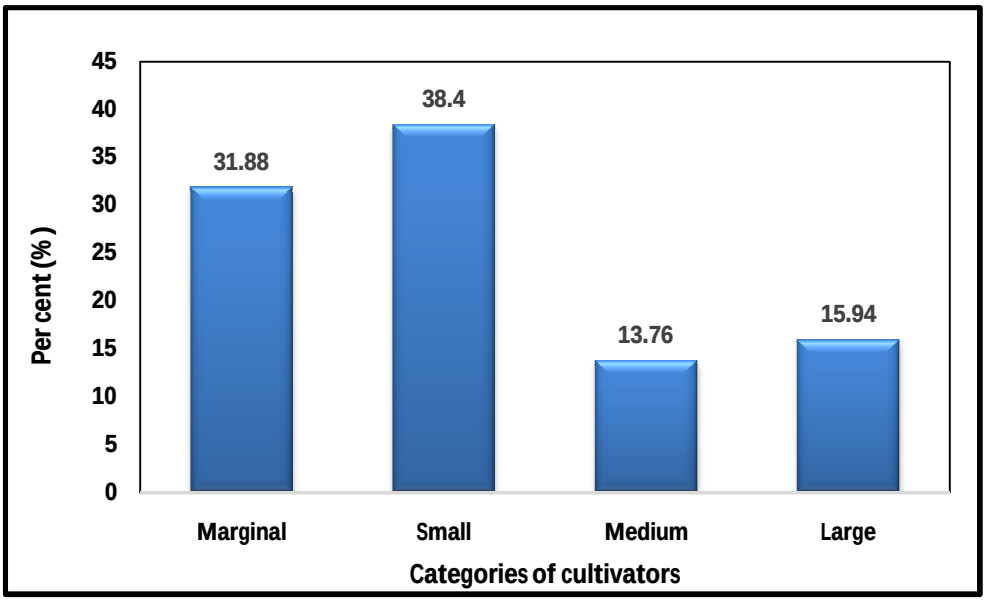

Fig 1. Per cent of cultivator to avail the custom hiring services

To known economic status of the custom hiring services profit-loss analysis was done in order to calculate the breakeven point and also determine the economic feasibility of the custom hiring services. During the study it was found that the, annual usage of tractor was more than 650 h as well as annual use of cultivator and rotavator were 400 h, Plough was also used by the cultivator annually 130 h where for sowing seed cum fertilizer drill was used around 200 h

annually. Multi crop thresher was used more than 500 h throughout the year. The annual use of the reaper for harvesting of rice was 170 h higher than annual use of disc plough, mulcher etc.

Table 2 shown that all the machinery have more than 100 h use annually, out of total machinery 70 % of farm machinery usage more than 150 h. From the [Table-2] it is clear that 70 % of farm machinery have annual usage more than 150 h. The annual usage of rotavator, cultivator, tractor, disc plough, reaper is more than 50 % where tractor is as a power source with all implements having maximum the annual usage. Break even analysis of all these machinery was calculated in order to know the Break Even Point. (i.e. how much time an implement will be used in order to have no profit and no loss and if these implements used above this point then they provide the profit by respective usage. From table 2, the positive values indicate the profit and the negative values indicate the loss from the implement for the given annual usage.

Economic Feasibility of Farm Machinery

After calculating the B.E.P., it is observed that most of the implements have B.E.P. more than their annual use i.e. net annual usage of machinery after the B.E.P. is reached to positive (where net annual usage after B.E.P. (h) = Annual use of machinery (h)-B.E.P. of machinery (h)) and if the annual usage > B.E.P. i.e. net annual usage is positive, implement provides profit and vice versa. Now the amount of profit or loss can be calculated as following formula

Annual profit/loss (Rs./year) = Net usage after B.E.P. (h/year) × Hiring charges (Rs./h)

The level of mechanization is increasing in all aspects in Kanker district of Chhattisgarh. Almost every types of agricultural equipment are being used by cultivators either by owning or through custom hiring. Model of custom hiring is very useful for providing the services of farm machinery for agricultural operation such as seedbed preparation, sowing, harvesting and threshing within a short period. Efforts are made through this study to document the information about the economic status of the custom hiring services of farm machinery along with quality of farm work for sustainable agriculture production in the Kanker district.

Table-2 Analysis of break even point of the machinery

S.No.	Individual Implement Name	Purchase price of implement (Rs.)	Hiring Price (Rs./h)	Total Fixed Cost (Rs./Year)	Repair and maintenance Cost (Rs./Year)	Variable Cost (Rs./h)	Annual Use (h/year)	Break Even Point (h/year)	Net use of implement after B.E.P.	Profit and loss (Rs./year)
1	Tractor	650000	700	107250	8980	303	650	270	380	265894
2	Rotavator	100000	400	3750	1071	233	437	22	415	165818
3	Thresher	250000	500	5653	1685	432	420	83	337	168434
4	Plough	30000	350	1408	453	260	130	16	114	40024
5	Seed-drill	50000	350	1220	392	253	193	13	180	63148
6	Cultivator	30000	500	493	160	222	400	2	398	199113
7	Reaper	120000	600	3102	953	412	170	17	154	92100
8	Disc plough	50000	250	2460	794	240	150	246	-96	-24000
9	Mulcher	250000	550	2905	840	390	140	18	122	67014
10	Tractor Trolley	200000	250	2233	310	217	85	68	17	4333

Conclusion

In the kanker district it was found that 38.40 per cent small and 31.88 per cent marginal cultivators avail custom hiring services at present. More than 70 % of cultivators having seed bed preparation implements like plough and cultivator. An average 40-50 hp tractor is available in villages for .doing agriculture and non agriculture work. Annual use of the rotavator was more than 430 h and annual usage of tractor was more than 650 h in most of the villages. Most of the hiring charges vary from 250-350 Rs./h except that of reaper and rotavator whose hiring charge is 500-600 Rs./h and 350-450 Rs./h respectively. Thresher whose annual use is more than 400 h are available in 60% villages of the Kanker district. Although the use of plough is high but its breakeven point is quite higher than that of annual usage. Tractor is maximum where tractor trolley is minimum profit per investment of hiring Also the implements like rotavator, cultivator, plough, seed drill, reaper and thresher provides good profit to the cultivator. It is also noted that to make a good profit one have to purchase at least tractor, rotavator, thresher, cultivator and reaper which provide a reasonable profit and if anyone wants to invest more money than it is preferred to buy multiple numbers of machinery like tractor, thresher, cultivator, rotavator, reaper, etc. as per the amount available. It was observed that the return on investment from a machine does not depend on its initial cost, it mainly depends upon the annual usages.

Conflict of Interest: None declared

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