Accessibility of Farm Machinery Services - CHSCs for Small and Marginal Farmers

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Abstract

Mechanization of agricultural field operations sooner than later is the need of hour in the present Indian Agriculture. Mechanization of agriculture, of course, has some constraints and limitations. Single farm ownership of any farm implement or machines on the small farm is not economically viable. But through custom hiring of agricultural machines even small farmers have been able to get the benefit of farm mechanization. Karnataka has a large number of small farms with land holding of less than 2 hectares and very poor economic condition. Hence the present study is an attempt to assess the performance of CHSCs (Custom Hiring Service Centers) established in PACS. The study reveals that the average number of villages covered by PACS (CHSC) was 11, average cultivable area covered is 10,386 ha and average number of small & marginal farmers were 2926.83. Utilization of machineries in CHSCs varies from 100 to 0 percent depends upon the type of machineries, suitability to the area, awareness about CHSCs, etc. It is observed that Private owners charge higher rates (average Rs.50 per hour) for machineries compared to CHSC's. However, the average net return earned by the CHSCs per year was very low (Rs. 8822/- per annum) which needs an attention for the betterment of the farming community in general and small & marginal farmers in particular. Further, the study revealed that there is only 25 percent of CHSCs comes under high performing, another 25 percent of CHSCs comes under medium and remaining 50 of CHSCs are comes under low performance. The CHSCs have helped to increase the productivity and income of small and marginal farmers to the extent of 10 to 15 percent. Therefore, there is a much scope for improving the performance of CHSCs for the benefit of small and marginal farmers.

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Introduction

Indian agriculture is undergoing a gradual shift from dependence on human power and draft animal power (DAP) to mechanical power because maintenance of DAP and manual labor is becoming increasingly costly coupled with scarce availability of fodder and feed to animal. Hence mechanical power has become more economical and indispensable to meet targets of timeliness and efficient utilization of natural resources and input use. Intensive cultivation also requires mechanization. Use of high capacity and energy efficient farm implements are more important in changing climate scenario. This includes limited sowing (window) period available due to delayed monsoon or long dry spells between rainfall events to complete farm operations. It is also relevant after prolonged water logging or for limited period suitable for various intercultural practices such as weeding or harvesting. Farm power availability from human and animal power sources has remained same or even reduced during past 20 years (0.24 Kw/ha in 1951 to 0.20 Kw/ha in 2009). Farm power from tractors mechanical and electrical sources put together increased 20 fold in the same period (0.04 Kw/ha in 1950 to 0.93 Kw/ha in 2009) (Srinivasrao etal 2013).

Timeliness of operations especially sowing and intercultural operations has significance for good crop stand and sustained productivity of crops. In rainfed agriculture regions of India, 6 to 8 weeks delay in onset of monsoon (kharif) results in some sort of panic among farming community in terms of completing sowing operation by the end of July. Other operations like hoeing, irrigation, intercultural, top dressing of fertilizer inputs, harvesting, threshing and marketing which need to be done at appropriate time otherwise farm productivity and income are adversely affected. Mechanization of agricultural field operations sooner than later is the need of hour in the present Indian Agriculture. Mechanization of agriculture, of course, has some constraints and limitations. Single farm ownership of any farm implement or machines on the small farm is not economically viable. But through custom hiring of agricultural machines even small farmers have been able to get the benefit of farm mechanization.

Custom hiring of farm machines was first introduced in Indian agriculture early decades of 19th century. Organized custom hiring to promote multi-farm use of agricultural machinery was made in mid-1960 when Agro-Industries Corporation (AIC) was established in the states. Custom hiring of farm implements got further boost when Government of India, in 1971, launched a scheme to set up agroservices centers all over the country.

Karnataka has a large number of small farms with land holding of less than 2 hectares and very poor economic condition. Single farm ownership and use of tractors and machinery on these small farms is

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not economically viable. But through custom hiring of agricultural machinery even small farmers have been able to get the benefit of agricultural mechanization.

In this view, Government of Karnataka also initiated establishment of Custom Hiring Service Centres (CHSCs) through Primary Agricultural Credit Co-operative Societies (PACS) by supplying tractor and associated implements and equipments in the year 2010-11 under Rashtriya Krishi Vikas Yojana (RKVY) to fulfil the needs of the small and marginal farmers. With this background, an attempt has been made in this paper to assess the performance and future scope of CHSCs established at Primary Agricultural Credit Cooperative Societies (PACS) or Vyavasaya Seva Sahakari Sangh Ltd. (VSSNL) by the Government of Karnataka in Raichur district.

Methodology

The primary as well as secondary data were collected for the study. The secondary data on number of CHSCs and list of machineries supplied and procedure for selection PACS or VSSNL were collected from Department of Agriculture, Government of Karnataka. The primary data related to utilisation of machinery, cost of maintenance, hiring charges, etc. were collected from the records of CHSCs (operating in PACS) and officials of PACS. In addition, to assess the performance of machinery and benefits received by the farmers were collected by conducting Focus Group Discussions (FGDs) in the selected CHSC villages. With regard to utilization of machinery, constraints in utilising the services and also suggestions were sought for the better performance of CHSCs both from the PACS staff and end users.

Sampling: Multistage sampling procedure was adopted for selection of district and taluks. For selection of CHSCs from each taluk, random sampling procedure was followed. There are 65 CHSCs in Raichur district spread over in five taluks, to assess the performance, 10 CHSCs (2 from each taluka) operating in PACS / VSSNL were selected for the study.

Analytical tools: Descriptive statistics and percentages were used for meaningful analysis and conclusion.

Results and Discussion

The performance of CHSCs working in the Raichur district was assessed with the help of both quantitative and qualitative data collected from the records of CHSCs, Officials of PACS, and the end users of farm machineries. The results are presented in the following sections.

Distribution of CHSC: Considering agro-climatic condition and density of Small and Marginal farms, Government of Karnataka initiated the CHSCs during 2010-11 by making utilization of funds available under Central sector schemes such as RKVY and Macro management. There are 660 CHSCs across 14 districts with total financial outlay of Rs.4877.51 lakhs were established during FY 2010-11 and 2011-12 (Table 1).

SI.		Number	Distribution	(Amount (Rs. Lakhs)		Allocation of	
No	District of CHSCs (%)		2010-11	2011-12	Total Amount	Amount (%)	
1	Bidar	60	9.09	294.69	149.22	443.91	9.10
2	Gulbarga	95	14.39	466.59	236.27	702.86	14.41
3	Yadagiri	29	4.39	142.43	69.64	212.07	4.35
4	Raichur	65	9.85	319.25	160.87	480.11	9.84
5	Koppal	33	5.00	162.08	80.64	242.72	4.98
6	Bellary	43	6.52	211.19	106.94	318.14	6.52
7	Gadag	52	7.88	255.40	129.32	384.72	7.89
8	Dharwad	23	3.48	112.96	57.20	170.17	3.49
9	Belagavi	62	9.39	304.51	154.19	458.71	9.40
10	Bijapur	87	13.18	427.30	216.37	643.67	13.20
11	Bagalkot	41	6.21	201.37	101.97	303.34	6.22
12	Chitradurga	33	5.00	162.08	82.07	244.15	5.01
13	Tumkur	22	3.33	108.05	54.71	162.77	3.34
14	Mysore	15	2.27	73.67	36.52	110.19	2.26
	Total	660	100.00	3241.59	1635.92	4877.51	100.00

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Characteristic features of the CHSCs

The selected CHSCs for the study are managed by the PACS, it was observed that there is wide spread differences in the number of villages covered, total number of members, total cultivable area, education level of CEO (Secretary of PACS), size of turnover, nature of business (some PACS doing banking business). The average number of villages covered by PACS (CHSC) was 11, average cultivable area covered is 10,386 ha, average number of small and marginal farmers were 2926.83 (Table 2).

Sl. No.	Particulars	CHSCs
1	Number of CHSCs selected	10
2	No. of CHSCs not responded	01
3	No. of CHSCs in conflict	01
4	Range of villages covered	4 to 34
5	Average Number of villages covered	11
6	Average geographical area covered (ha)	13803.72
7	Average cultivable area covered (ha)	10386.80
8	Average irrigated area (%)	35.84
9	Average number of Small and Marginal farmers covered (No.)	2923.86

Table 2: General Characteristic features of the CHSCs in Raichur district, Karnataka

Type of Farm Machineries in CHSCs

Considering the agro-climatic conditions, cropping pattern, farm machinery density and demand for farm machineries, the type of machineries were distributed across CHSCs in Karnataka. However, the tractor (33 HP) is distributed for all the CHSCs, the associated machineries varies from region to region. The machineries distributed in CHSCs of Raichur district are Tractor, Rotovator, Multicrop Thresher, MB plough, Cultivator, Leveller blade, Blade Harrow, Seed cum Fertilizer Drill, Knapsack sprayer, Power weeder and Winnowing Fan (Table 3). On an average, 13 farm machineries / equipments were supplied to each CHSC amounting to Rs. 7.58 lakhs.in Karnataka.

Table 3: Supply of Farm Machinery to each CHSCs in Raichur district, Karnataka

		2010-11		2011-12		Total	
SI. No.	Supplied farm machineries / equipments	Number	Price / unit (Rs.)	Number	Price / unit (Rs.)	Total Number	Amoun t (Rs.)
1	Tractor	1	3.43	0	0.00	1	3.43
2	Rotovator	1	0.57	0	0.00	1	0.57
3	Multicrop Thresher	1	0.91	0	0.00	1	0.91
4	MB plough	0	0.00	1	0.29	1	0.29
5	Cultivator	0	0.00	1	0.30	1	0.30

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6	Leveller blade	0	0.00	1	0.17	1	0.17
7	Blade Harrow	0	0.00	2	0.18	2	0.35
8	Seed cum Fertilizer Drill	0	0.00	1	0.40	1	0.40
9	Knapsack sprayer	0	0.00	2	0.18	2	0.36
10	Power weeder	0	0.00	1	0.49	1	0.49
11	Winnowing Fan	0	0.00	1	0.32	1	0.32
	Total	3		10		13	7.58

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Utilization pattern of Machineries in CHSC

Utilization of machineries in CHSCs varies from 100 to 0 percent depends upon the type of machineries, for instance, tractor is utilized in almost all CHSCs, Rotovator (62.50 percent), followed by blade harrow, the least used machineries were power weeder, Winnowing Fan, and Electronic balance. The details of utilization of machineries are presented in Table 4. However, economic utilization of machineries is lacking in most of the CHSCs. The main reasons for under utilization of machineries are; lack of awareness about how to use and need does not arise for use especially for power weeder, electronic balance and winnowing fan. The poor quality and non suitability of machinery for specific location was another reason for non-utilization of machinery like seed cum fertilizer drill, cultivator, leveller blade, blade harrow and Rotavator. Multi-crop thresher was made use by only one CHSC out of eight CHSCs selected for the study. The main reason for non-utilization of multi-crop thresher was that it was supplied without cart. Hence, CEOs who are enterprising have made effective use of supplied farm machinery. The under utilization was observed even with respect to Knapsack sprayers, this was partly due to difficulty in monitoring and partly due to possession by the individual farmers. Above all, it was reported that machineries are supplied without consultation of PACS. Hence, there is a need to give attention to all these problems for proper utilization of machineries.

Table 4: Utilization of farm machineries/ equipments in CHSC's in Raichur district,

Karnataka

Sl. No.	Supplied farm machineries / equipments	Utilization in CHSCs (N=8)			
		Number	Percent		
1	Tractor	8	100.00		
2	Rotovator	5	62.50		
3	Multi-crop Thresher	1	12.50		
4	MB plough	5	62.50		
5	Cultivator	2	25.00		
6	Leveller blade	3	37.50		
7	Blade Harrow	4	50.00		
8	Seed cum Fertilizer Drill	2	25.00		
9	Knapsack sprayer	2	25.00		
10	Power weeder	0	0.00		
11	Winnowing Fan	0	0.00		
12	Electronic balance	0	0.00		

Custom Hiring rates

Apart from CHSCs, there are many number of unregistered and self employed medium to large farmers are also providing the hiring services of farm machineries but which are inadequate, untimely and expensive in the region. The CHSCs through Co-operative Societies have further augmented the availability of custom hiring services in the region. The custom hiring rates prevailing in the region during 2012-13 are given in Table 5. Private owners charge higher rates (average Rs.50 per hour) for machineries compared to CHSC's.

Table 5: Custom Hiring rates charged for farm machineries by Private and CHSCs in

Raichur district, Karnataka

SI No	Farm machineries / equipments with tractor	Hiring charges		
51. NO.		Private individuals	CHSCs	
1	Rotovator(Rs. Per Hr)	650	600	
2	Multi-crop Thresher(Rs. Per qtl)	20	15	
3	MB plough (Rs/hr)	550	500	
4	Cultivator (Rs/hr)	450	450	
5	Leveller blade (Rs/hr)	500	400	
6	Blade Harrow (Rs/hr)	450	400	
7	Seed cum Fertilizer Drill (Rs/hr)	700	650	
8	Knapsack sprayer(Rs. Rent per day)	100	50	

Costs and Returns of CHSCs

The costs incurred by the CHSCs in operating and maintaining the machinery was worked out considering both fixed and variable costs. The variable costs like cost of fuel, lubricants, repair and replacement of spare parts and fixed costs like depreciation and insurance were considered. Gross returns were worked out by multiplying the number of hours worked by each machinery/equipment in a year and per hour hiring charges for respective operation. This analysis facilitated in assessing the performance of CHSCs. The results presented in the Table 6 reveals that the average net return earned by the selected CHSCs per year was very low (Rs. 8822/- per annum) which needs an attention for the betterment of the farming community in general and small and marginal farmers in particular. This analysis further prompted to categorise the CHSCs based on their financial performance.

Table 7: Costs and Returns of Custom Hiring services by CHSCs in Raichur district,

Karnataka during 2012-13

SI. No	Particulars	Amount (Rs.)
1	Average Number of hours worked (hrs)	111
2	Average operational cost incurred	28,255
3	Average fixed cost	25,356
4	Total cost	53,611
5	Gross returns	62,433
6	Net returns	8,822
7	Returns per month	735

Performance of CHSCs

The performance of selected CHSCs was evaluated based on the net income generated per year and number hours worked and operation cost per year. Based on the net income per year, the CHSCs are classified into 3 categories: High, Medium and Low performing societies (Table 7). The study reveals that there is only 25 percent of CHSCs comes under high performing, another 25 percent of CHSCs are comes under Medium and remaining 50 of CHSCs are comes under low performance. The main factors responsible for low performance are; 1.Lack of interest of CEOs of PACS for promotion and providing necessary support mainly they do think it is additional work burden to them 2. Lack of trained personnel for operation and management of machineries in PACS. 3. Lack of awareness among members and their representatives about CHSCs, 4. Insufficient working capital with PACS for operation and management of machineries etc. 5. Non-availability of service on credit basis and not much difference in the hiring charges between private and PACS- CHSCs. 6. The usage of tractor, tractor drawn implements and other power equipments is seasonal and hence some CHSCs expressed their difficulty to employ a person exclusively for maintaining machinery and equipments. 7. The capacity of tractor is not sufficient for certain implements especially for rotavator and MB Plough. 8. The implements supplied are not of standard quality especially the seed cum fertilizer drill and the cultivator. 9. Multi-crop thresher utilization is less as it is supplied without cart and

hence it is lying idle in majority of CHSCs. 10.Record maintenance is poor and some of the CHSCs not at all maintained records of machinery and equipments.

Table 7: Performance of CHSCs in Raichur district, Karnataka based on net returns

(N=8)

SI. No	Particulars	Per cent of CHSCs
1	High Performing CHSCs (Net returns > Rs. 54,500)	25
2	Medium Performing CHSCs (Net returns < Rs.20,000)	25
3	Low Performing CHSCs (Negative net returns)	50

Social and Economic Impact of CHSCs

Raichur district comes under North eastern Karnataka region, which is considered as backward region of the state (Constitution Article 371J). The economic and social status of farmers is lower than state average even though about 40 percent of cultivable area is under irrigation. Majority of the operational land holdings are either marginal (<1 ha), small (1-2 ha) or semi-medium (2-4 ha) in size. Many studies have indicated that investment capacity of majority of the farmers in these categories of land holdings is poor. These farmers cannot own expensive farm machinery. However, they are making use of modern technology like combine harvester, tillage equipment and planting/sowing machinery through custom hiring through private people. The CHSC through cooperative institutions (PACS) has helped them improve the timeliness of operation, to increase land productivity and increase economic returns to the extent of 10 to 15 percent as per the focus group discussions conducted in the selected villages.

Conclusion and Policy Implications

The study conclude that performance of CHSCs in Raichur district have greatly helped the mechanization of farming operations of small and marginal farmers by doing timely operations with lower cost. The CHSCs have helped to increase the productivity and income of small and marginal farmers to the extent of 10 to 15 percent. Therefore, there is a much scope for improving the performance of CHSCs for the benefit of small and marginal farmers. The following suggestions are recommended for improving the CHSCs.

- There is a need to create awareness about CHSCs among the farmers members through general body meeting, posters and other means of communication by the PACS in its jurisdiction.
- There is a need to provide service on credit basis or reduce hiring charges to make PACS-CHSCs competitive in the market.
- Make a necessary changes in provision of State Cooperative Act, for appointing a qualified and trained person either on contract or full time basis for operation, repair and maintenance of machineries available in CHSCs.
- To ensure the supply of quality implements, machinery with all accessories and infusion of business professionalism will go a long way in improving the performance of CHSCs.
- There is a need to provide the necessary training for CEO's and representatives of PACS about technical details of farm machineries, uses, benefits and record keeping and concept, professionalism through the competent institutions/Universities.

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