

MECHANIZED PADDY CULTIVATION AND IT'S PROBLEMS IN THE AMPARA DISTRICT

A. N. AHAMED

Department of Agricultural Economics Eastern University

Introduction:

In most developing countries, food policy was aimed at increasing production through introduction of modern technologies. These include the development of crop varieties, improved cultural practices, irrigation systems, and farm mechanization. Although mechanization may be blamed for increasing unemployment it is frequently justified because it permits faster and more efficient cultivation, particularly of heavier and more difficult soils. This may lead to increases in cropping intensity and employment (Wattanutchanya, 1983).

This study focuses on:

1. The characteristics of four-wheel tractor hirers and owners.
2. Type, age of the four-wheel tractors available in the area and the sources of capital available for purchasing tractors.
3. Reasons for using and renting - out tractors.
4. Problems encountered in ownership, operation, and maintenance.
5. Problems encountered in hiring tractors.

Methodology:

The district of Ampara was purposely selected as the study area because (i) 84 percent of the farmers in this area were using tractors, and (ii) rice cultivation is highly intensive in the district compared with other paddy producing areas. Four villages of the Ampara district namely Nintavur, Addalaichenai, Irakkulam and Varipathanchenai were selected randomly. The rice farmers from these villages were selected using a stratified random sampling technique with proportional allocation. The rice farmers were stratified into tractor-owning farmers and tractor hiring farmers. In each sample village, separate lists of tractor - owning farmers and tractor-hiring farmers were prepared. A total sample of 174 rice farmers consisting of 124 tractor-hirers and 50 tractor owners were randomly selected.

Due to government efforts to promote farm mechanization in Sri Lanka which began in the late 1940's and the early 1950's, four-wheel tractors were imported at the rate of 8000 per decade and two-wheelers at 3500 per decade (Harris, 1970).

For this reason, Sri Lanka now has a tractor density approaching that of Indian Punjab and some 45 percent of annual paddy acreage in tractor ploughed (Farington and Abeyratne, 1982).

average farm size of the tractor owners (11.7 acres) was significantly larger than that of the tractor hirers (6.4 acres). The rice farmers with large farms generally have their own tractors to facilitate faster land preparation. They usually rent out their tractors to earn additional income, which in turn, has been used as supplementary capital for the purchase of material inputs such as fertilizer and other chemicals.

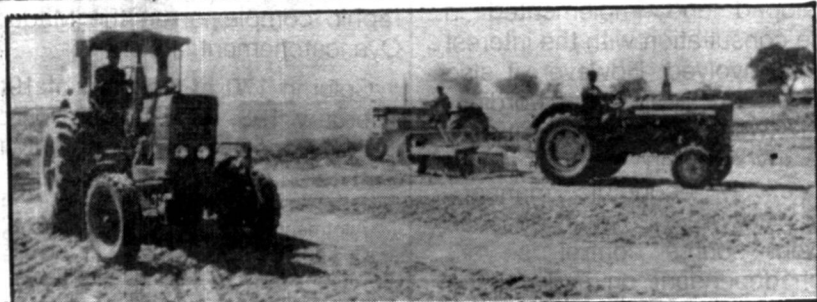
There were no significant differences in yield and cropping intensity between the two farm groups. However the average yields per acre in the "Yala" season were significantly higher than those of the "Maha" season for both groups.

This is due to the abundance of sunshine and the availability of irrigation water throughout the dry season. The average cropping intensity of the tractor owners was 192% while the tractor hirers had an average cropping intensity of 188%. High cropping intensity in the study area might be attributed to irrigation and mechanization.

Eighty two percent of the tractor hirers are land owners and the rest are lessees and share tenants. In the case of tractor owners, 72 percent of them are land owners and the rest are lessees and share tenants. Rice farming is the primary occupation of the majority of both tractor owners and the tractor hirers (70 percent of the tractor owners and 60 percent of the tractor hirers). A large percentage of the tractor owners, however, had reported that rice farming was their primary occupation as compared to the tractor hirers.

Type, Age and Source of Capital:

The most common make of tractor (68 percent) used in the sample villages was MF 240. About 32 percent of the sample farmers used MF 135. Ninety four percent of the tractors were solely owned, with an average age of 3.7 years. Since a large amount of capital is required in purchasing a tractor,



Results Characteristics of the sample farmers:

The tractor hiring farmers were, on the average, significantly older

(41 years) than the tractor owners (24 years old). There was, however no significant difference in the mean educational attainment between these two farm groups. The

the tractor owners had to obtain loans from Commercial banks and other financing companies for the purchase of a tractor. Forty eight percent of the tractor owners obtained loans from Government Commercial banks while only 22 percent borrowed capital from private companies. About 30 percent of the farmers used their own capital in purchasing their tractors.

There were 137 four-wheel tractors in service in the sample villages. Out of this total, 80 percent were hired out. On the average a tractor ploughed 56 acres in the "Yala" season and 68 acres in the "Maha" season.

Reasons for Using and Renting-Out Tractors:

Table: 1 Shows the reasons for using and renting out tractors in the study villages. Timeliness in land preparation operations was the most common reason cited by the sample respondents for using tractors (60% of the tractor hirers and 36% of tractor owners). Most of the farmers believed that machine services would save time in land preparation, thus enabling them to plant earlier and increase their cropping intensity. In the past, the slow pace in land preparation with the use of draft animals had caused delays in their planting schedule.

The second most important reason cited was the unavailability or lack of draft animals that could be hired in the study areas (24 percent of the tractor hirers and 16 percent of the tractor owners). The other reasons mentioned for using tractors, were the increase in leisure time and less strenuous land preparation were more efficiently done with the use of tractors. Mechanical land preparation also relieves the farmers of the problem of hiring or maintaining work animals. Tractors can prepare much larger areas quickly than the work animals and require none of the care and feeding that the work animals require during the off-season.

In the case of the tractor-owners, the primary reasons for renting-out their tractors or for doing custom work was to augment their income.

Problems with regard to tractor use:

Lack of available tractors that they could hire at their time of need was the most important problem that the tractor hiring group encountered. Due to the large capital requirement for the purchase of tractors, many farmers in the sample villages could not afford to buy their own tractors. This was, therefore the major reason why there were few tractors in the sample villages. The shortage of tractors was further intensified because of the farmer's practice

high fuel and maintenance costs, the tractor owners had to charge the tractor hirers Rs 800-1000 per acre. Because of the high contract rates that they had to pay, the production cost of the tractor hirers had, in turn, increased thereby reducing their profit margin. Hence, the tractor hirers mentioned that the benefits they derived from tractor use were fewer compared to those of the tractor owners because their farms were not thoroughly prepared and also because of their higher production cost.

On the other hand, the main problem faced by tractor owners was the fuel shortage during the peak months for land preparation

**Table 1
Reasons for using tractors, 174 sample farms
(Ampara district)**

Reason	Tractor Hirer		Tractor owner	
	No.	Percent	No.	Percent
Saves time and allows farmers to plant on time	74	60	18	36
Less strenuous work or eases physical burden	12	10	04	08
Unavailability of working animals for hire	30	24	08	16
Work done more efficiently	08	07	08	16
To augment income			12	20
Total	124	100	50	100

of performing land preparation operations simultaneously. In view of the high work load of the tractor drivers or operators as a result of the high demand for tractor services in these areas, they failed, therefore, to do a good job. In order to meet the demand for tractor services, land preparations were hurriedly done. The farmers reported that thorough land preparation could have substituted for weed control methods. With thorough land preparation, weed population would have been reduced, thereby minimizing the cost of weeding or weed control.

Moreover, the tractor hirers complained about the high contract rate for tractor work. Due to the

activities (Table: 2). Due to fuel shortage, land preparation tasks were often delayed and this was also mentioned as a major factor for the inability of the tractor drivers to meet the tractor hirers demand for custom services. This delay in the completion of land preparation operations sometimes caused lower crop yields or crop failures in a number of farms.

Another problem that the tractor owners encountered was the increasing cost of hired labour. Due to the increase in their cost of living, the tractor drivers even took trade union actions to exert pressure on the tractor owners to meet their demand for higher

wages. These labour disputes between the tractor owners and the drivers mostly took place during the peak land preparation schedule. Such labour disputes also served as a contributing factor to the delay in the completion of land preparation activities in the sample villages.

Unavailability of spare parts and inadequate servicing or maintenance of the tractors were also among the major problems confronting the tractor owners. Political allegiance or affinity was often found to be a barrier to obtaining spare parts from authorized agents. Moreover, due to the fact that the authorized agents have limited stocks of spare parts, the tractor - owners had to purchase

and maintenance costs, all interact to make profitability of tractor ownership highly variable.

Conclusion

In view of the high demand for tractor contract services, land preparation operations were hurriedly done by the tractor drivers or operators. Another problem mentioned was the high custom rates charged by the tractor owners which averaged Rs 800 - 1000/= per acre. This in turn, reduced the profit margin earned by the tractor hirers. High tractor custom rates, were attributed to the increase in wage rates of the tractor drivers, rising fuel costs, as well as the increase in repair and maintenance expenses. Lack of available spare

there has been a substantial increase in the demand for tractor custom services in recent years in the Ampara district, but the number of four wheel tractors in the district is still insufficient to meet the increasing demand for tractor custom services. The high demand for tractor contract services in the district might be correlated with the availability of assured irrigation facilities and the scarcity of labour and working animals in the area. Such high demand for tractor contract services in the study area has increased utilization of tractors, thereby increasing repairs and maintenance expenses of the tractor owners. Maintenance problems attributed to lack of imported spare parts and skilled mechanics were among the major problems of the tractor owners.

Table 2
Problems encountered by the tractor owners
50 sample farms, Ampara district

<i>Reason</i>	<i>No. of Farms Reporting</i>	<i>Percentage</i>
High Maintenance cost	43	86
Fuel Shortage	32	64
Non-availability and high cost of spare parts	36	72
Increasing wages of tractor drivers	45	90
Lack of specialized or skilled tractor mechanics	26	52

The percentage does not add up to 100 because the sample farmers gave multiple answers.

their spare parts from private agents who charged from 1.5 to 5 times higher than the official price. Maintenance cost, therefore, varied from 4 to 74 percent of their total gross income from their tractor-renting operation. Repairs and maintenance expenses have risen due to the scarcity of spare parts and the black marketing operations in the district. Hence, the tractor business operation can be considered as a highly complex one. The type and age of the tractor, the type and combination of jobs performed, the contract rates charged, the number of days worked, fuel costs and the repair

parts & blackmarket selling of spare parts contributed to a large extent to the increase in repair and maintenance expenses of the tractor owners. Fuel shortage during the peak months for land activities were also reported to have caused delays in the accomplishment of land preparation operations and served as a major factor for the tractors owners' inability to meet the demand of other farmers for tractor custom services. Such delays sometimes caused crop failure in a number of farms.

Based on the foregoing discussions, it can be concluded that

Findings of the study have also indicated that large farmers were the tractor owners and had a higher demand for tractor services compared to the small farmers, implying that the rich and large farmers would largely benefit from mechanization of land preparation. The fact that tractors can prepare much larger areas rapidly than the work animals has motivated the rich farmers with large landholding to own a tractor.

The high custom rate appeared to be the most serious problem confronting the tractor hirers. This might have a serious implication on the future demand for tractor custom services depending on the availability and rental cost of working animals in the district. Increases in the prices of fuel and the wages of the tractor drivers, as well as repairs and maintenance expenses had made tractor use more expensive in the study area. Despite the increase in tractor custom rate, the hirers could not revert back to the use of animal power because of the scarcity of working animals.

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With these problems confronting the tractor users in the study area, the following recommendations are, therefore made:

1. Local manufacturing of small tractors and spare parts should be promoted by the government without government protection, or subsidization in order to reduce the cost of tractor contract services and to serve on foreign exchange. Local manufactures should develop effective, easy to operate and maintain small tractors. As a result, cost differences between animal and tractor power services will become small enough to induce an increasing number of farmers to purchase or rent small tractors.
2. The government should also assist in training mechanics and

machine operators since available skilled mechanics in the study area are still inadequate.

3. The government should not subsidize the manufacture, purchase or use of tractors through low-cost credit programmes (subsidized interest rates). Based on past experiences in various countries, such programmes have seldom benefitted the majority of the farm population. Instead, easy credit (more and bigger loans) should be provided without any interest subsidy to attract the local manufacturers to invest in the manufacturing business, as well as to provide the farmers, enough capital which will enable them to purchase or rent locally produced, low-cost tractors.
4. To help the small farmers, who

cannot afford to buy their tractor avail of tractor services, the government through existing farmer organizations and cooperatives, should look into the establishment of a tractor pool or the organization of a tractor contract system in the area similar to those existing in Thailand and Malaysia. If this will yield the desired benefits, farmers's training on the operation and maintenance of the tractors should follow.

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