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## UTILISATION OF TRACTORS IN THE RICE INDUSTRY IN GUYANA

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Until the beginning of the twentieth century, rice cultivation catered mainly for the internal demands of the Guyanese population. The first major expansion occurred after the first world war when Guyana was expected to satisfy the shortages in grain importation for the entire British West Indies. However, it was not until the second half of this century that the industry expanded in cultivation using new husbandry techniques with the widespread use of tractors and combine harvestors.

The unprecedented growth of the rice industry is mainly responsible for capital accumulation in the rural sector with linkages in the towns. Although rice represented 3.3 per cent of the gross domestic product at factor cost in 1974, this industry accounted for 8.1 per cent or 49 million dollars of total exports [1]. Only sugar and bauxite exceeded the value of exports of rice. However, the physical output of rice exceeded that of all major commodities in 1974.

In the 1946 crop year, 88,167 acres of the grain were planted which yielded 60,672 tons of rice. The production in 1974 reached 170,200 tons from approximately 250,000 acres of cultivation. As a result of favourable weather and incentives to plant the spring crop, the 1974 production represented an increase of 60,000 tons or 60 per cent above the 1973 output [2].

It is estimated that the assets of the industry is presently valued at over 300 million dollars. Besides employing directly 40,000 families in rice cultivation, the industry caters for employment of many more workers in auxillary services such as commerce, transportation, banking and insurance. Recognising the importance of the industry, Forbes Burnham declared that, if the rice industry prospers, *"Guyanese economy to that extent prospers, if it suffers, Guyanese economy to that extent suffers"*. [3].

Concomittant with expansion in increased production, is the remarkable decline in yield per acre. Average yield per acre declined from 17.2 bags (140 pounds) in 1899 to 13.6 bags in 1963 and then to 9.8 bags in 1969. Despite the application of fertilisers, the planting of improved varieties and technological inputs, the yield was only 11.8 bags per acre in 1972. The two most important factors that contribute towards low yields in Guyana's rice industry are the extensive use of tractors 4 in preparing the cultivated fields and inadequate water control. Less than 40 per cent of the land under rice cultivation are drained and irrigated so that effective water control cannot be practiced [5].

There is pronounced underutilisation of manpower and machinery in the industry. According to Rene Dumont, rice farmers spend on the average 38 days on their cultivation yearly. Except on government land

development schemes, where the size of holdings is 15 acres, the average farmer cultivates in the country less than 5 acres of land. The optimum size of a rice farm is considered to be 50 acres. In this framework of the existing size of holdings the decline in productivity and utilisation of manpower and other resources, the following analysis is focused on the utilisation of tractors in the Black Bush area in Guyana.

The Black Bush land development area is the largest rice producing district in Guyana. There are 27,000 acres of well-drained and irrigated land which is suitable for rice cultivation. By means of a pre-tested questionnaire, all the farmers who possessed a tractor were to be interviewed. The response rate was 93 per cent which represented 263 farmers.

Demographically, the majority of the farmers are persons who are much advanced in age. Less than 20 per cent of all the farmers in this area were under 40 years of age, while 24 per cent were between 45 to 49 years of age, and 40 per cent were over 50 years. Among all the respondents, 73 per cent did not complete their primary education. As with other rural households, 88 per cent of all families consisted of six and more persons. Many of the families were very large with 54 per cent having nine and more persons.

The most common tractor that is used in the industry is the Massey-Ferguson 35 model which has approximately 36 horse power. This small-sized tractor has a successful work performance in both dry and wet cultivation conditions. About one-third of all farmers who purchased tractors were the second owners of their machines. Only 59 per cent of the original owners continued to have their own machines. The majority of tractors have been fully amortised. Only 22 per cent are less than nine years old, whereas 73 per cent are between 10 to 19 years.

Although these machines are not obsolete, they are no longer manufactured so that farmers have difficulties in their servicing. This model of tractor uses a two-disc plough. Besides the tractor and plough, the majority of farmers do not possess other types of equipment; for example, 89 per cent do not own a chipper or barrow, 88 per cent do not have a back blade for grading purposes, 68 per cent do not own a rake, while 98 per cent have never acquired a rotovator. Although irrigation is a major problem in the rice industry, only an insignificant proportion actually own an irrigation pump. Even their transportation accessories such as a trailer and dragger are in short supply. The absence of equipment for land preparation, irrigation and transportation have mainly contributed towards reduced yield per acres. In many fields it is almost impossible to maintain uniform water levels which implies that there is ineffective use of fertilisers and the control of pests and diseases.

The majority of tractors are in poor working condition. Only 33 per cent of these machines start with a battery. On the whole 52 per cent are working satisfactorily. Most of the tractors have small grip tyres which necessitate the use of iron cage wheels for work in wet conditions. These tyres are generally smooth and have not been replaced for more than five years. The following table shows the working condition of major parts of the tractors:

Table 1. Working State of Major Sections of Tractors, 1974

(percentage)

Sections of Tractors	Working condition				Total
	Working perfectly	With little problems	With major problems	Not working	
Engine	52.1	31.9	12.6	3.4	100
Gear Box	71.1	21.3	5.3	2.3	100
Hydraulic	52.1	38.0	7.2	2.7	100
Brakes	52.0	19.4	4.6	22.1	100
Cut-out	51.3	7.3	3.4	35.0	100
Generator	54.8	8.4	3.8	33.1	100
Starter	48.3	8.8	3.0	39.9	100
Radiator	75.3	17.1	6.1	1.5	100
Steering	75.7	17.1	4.6	1.9	100

The inflated price of tyres and spare parts for tractors is mainly responsible for the run-down state of most machines. Nonetheless, most tractors have an annual or seasonal overhaul of all the major parts, and only when it is absolutely necessary parts are replaced. Welding of machines and equipment require a substantial annual expenditure. Fifty-eight per cent of farmers spend more than \$50 per annum for this requirement. The majority of farmers use the skills of a paid mechanic for repairs. This service is relatively inexpensive after considering the poor state of the machines. According to the farmers, 24 per cent pay less than \$50 for mechanical service, while 30 per cent pay \$50 to \$99 and 26 per cent pay \$200 and more. In preparation for the autumn crop and repairs during the crop, 30 per cent of farmers spend over \$700 on parts. Only 7 per cent have a capital outlay of less than \$99. See Table 2.

Table 2. Expenditure on Parts for Tractors During the Autumn Crop, 1974.

Expenditure	No.	%
No money	17	6.5
Less than \$99	17	6.5
\$100 - \$199	21	8.0
\$200 - \$299	18	6.8
\$300 - \$399	29	11.0
\$400 - \$499	28	10.7
\$500 - \$599	40	15.2
\$600 - \$699	13	4.9
\$700 and over	80	30.4
Total	263	100.0

In recent years farmers experience enormous difficulties in obtaining parts for their machines. On account of this factor, the majority of tractors were idle during the year. During the prime crop time only 11 per cent of all the tractors worked all the time, while 45 per cent were idle for 25 and more days. These proportions indicate the high rate of underutilisation of these machines which directly affects the planting and harvesting cycle, as well as the productivity from the land under cultivation. The reasons for the idle time were partly because of difficulty in obtaining spare parts, the unavailability of mechanics for repairs when required, shortage of capital to purchase parts and fuel, bad weather, unavailability of a driver, other engagements of farmers, and inadequate farmland for cultivation.

The average tractor is used to cultivate two 15-acre plots of land. Only 22 per cent of tractors are employed in cultivating 45 and more acres. See Table 3. It is estimated that with minimal equipment a small-sized tractor is capable of cultivating about 100 acres of land under normal conditions. If these machines were utilised for land preparation on a 24 hour roster with the required service time, then the land preparation productivity would increase by more than two times. There was no farmer during the 1974 autumn crop who worked his tractor for more than 10 days at nights. Only 26 per cent used their tractors for less than two hours in the evening. The majority of farmers indicated that they were afraid that their machines would break down if they worked at nights. Another reason is that 40 per cent of the tractors have no lights for night work.

Table 3. Acres Cultivated by Tractors for the Autumn Crop, 1974.

Acres	No.	%
Less than 9 acres	22	8.4
10 - 19 acres	105	39.9
20 - 29 acres	30	11.4
30 - 39 acres	49	18.6
40 - 49 acres	20	7.6
50 - 59 acres	5	1.9
60 - 69 acres	15	5.7
70 - 79 acres	5	1.9
80 and more acres	12	4.6
Total	263	100.0

Besides rice cultivation, the average farmer used his tractor for other activities such as travelling to the rice fields to care their cultivation, transporting rice, bran and other by-products, and planting vegetables and ground provisions. The survey shows that only an insignificant proportion of farmers use their tractors for non-economic activities. Since the steep increase in the price of fuel, many farmers are reluctant to use their machines for travelling to their holdings.

The foregoing analysis shows that tractors in the Black Belt area are underutilized. In a situation where costs are rapidly increasing and income relatively stagnated, it is necessary to increase efficiency so as to improve the standard of living of the rice farmer. The high cost of spare parts and fuel which is a direct result of imported inflation is the most important constraint in the utilisation of tractors. Some farmers are contemplating on returning to the bull and plough method of cultivation. This is not the answer to the current problems of the rice industry. The most likely feasible alternative is to introduce modern husbandry techniques which would facilitate intensive cultivation. Most of the land under rice cultivation can yield twice the present output with improved tilling of the soil, use of new varieties of seed, fertilisers, water control, insecticides and weedcides. With the price of tractors at an average rate of over 25 per cent per annum, in the near future, most farmers would not be able to buy these machines. Consequently, farmers with tractors and equipment should be provided with the necessary facilities and incentives to maintain their machines in a productive and operational condition.

### References

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