

Abstract of Thesis	
Name	Ujang Paman
Title	Mechanization of Small-Scale Rice Farming and Small Farm Machinery Operations in Riau Province, Indonesia
	<p>The use of farm machines becomes increasingly important for mechanizing small rice farming and modernizing rice production system. This study aims to determine the mechanical power availability, mechanization capacity, time and labor requirements, and costs for small rice farming operations; to examine the specific problem associated to tractor breakdowns, the factors effecting on repair costs, and develop a reasonable repair cost model; to evaluate the economic potential of tractor hire businesses and know coverage and seasonal working areas of the hiring businesses managed under farmer groups; to compare the working performance and cost for three types of power tillers; and to recommend improvement measures associated to small machinery operation and management. Data were based on a field survey from four purposively selected regencies: Kuantan Sengingi, Rokan Hulu, Siak, and Kampar in Riau Province. Interviews were conducted by using questionnaires. The collected data consisted of primarily and secondary data. Simple descriptive and statistical techniques and cost accounting method were used. Results show that the average mechanical power available to rice farmers is very low at about 0.31 hp/ha. The mechanization capacity increased at relatively low at around 20.6% during 2006-13. The labor required to complete rice farming operations was 83.26 man-days/ha, whereas the mechanical power was only 7 machine-days/ha. The total time required for rice farm operations was 851 h/ha on average. The total cost of rice farming operations was IDR 7,895.83 thousand/ha (US \$877). This overall cost is relatively high because of the larger cost of human power. The tractor breakdowns were caused by operators' mistakes, inferior fuel and oil uses, poor field conditions, poor maintenance, intense usage, and poor farm roads. Inadequate repair shops, lack of spare parts, and shortage of local mechanics caused the repair to take longer and high costs. The annual repair costs were statistically affected by age, use, horsepower, and operator skill. Ownership and manufacture variables were not significant explanatory variables in the model. A reasonable model was proposed to predict the annual repair costs. Majority of tractor hire services is profitable under operating in wetland paddy. Tractor owners received profit IDR 926 thousand/year (U.S. \$109) on average under annual use of 23.13 ha and service charge of IDR 348 thousand/year (U.S. \$41). The number of machines managed by groups was not sufficient to work the entire coverage area owned by the group members. The limited number of available machines, short working days/season, small paddy field areas, and low working capacities caused the smaller seasonal working area. Hydro tiller was the best in terms of working performance, operational cost savings, and profitability. The mechanization programs should be expanded to increase mechanization capacity and complete farm works in timely and short time. The mechanical power available must be increased by providing more farm machines for farmers. Machine operators should be well-trained and supporting facilities and training programs must be made available for correctly operating and maintaining machinery. The use of farm machinery for custom hire services should be encouraged to develop machines ownership in the province.</p>