

CUSTOM FARMING (SERVICE PROVIDING) SYSTEM IN PADDY FARMING IN MALAYSIAN GRANARY AREA

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Abstract

Rice is an important food commodity in Malaysia and remains relevant to agriculture sector in Malaysia and this subsector is essential to ensure national food security. According to Muda Agriculture Development Authority (MADA) (2008), 90% of the farmers used modern mechanization and outsourcing their farm operations such as land preparation, seedling, planting, fertilizing, pest and diseases managing and harvesting. For these farm operations, the service for machinery and wage labor was provided by private service providers and Area Farmer Association (AFO). Custom hiring (Service Providing) System is really important due to the risen in the cropping intensity (Double Cropping System) and farm size (economic scale) in paddy farming in Muda granary area. However, how this custom farming system (Service Providing System) was established and the reason why they are still relevant until now was not yet identified. This study attempts to investigate the actual status of the service providing system (custom farming) in paddy farming in Muda area. This research focus on the role of service providers and the brokers as the middleman in service providing system that shows on how they cooperate and provide various services to farmers. Several aspects may influence the loyalty of farmer to the provider and broker such as reasonable rate of payment given by the provider and close relationship from generation to generation. However, there might be some ambiguity about the way of services performed by the provider and the broker. Therefore, by identifying any problems exist in this system, it will determine whether this system is effective or not. Subsequently, a better guideline or policies have to be created in order to improve the smoothness of the service providing system comparable with custom farming system in countries such as United States and Japan.

Keywords: Service Providing System; Custom Farming; Paddy Farming

Introduction

Rice is an important food commodity in Malaysia and remains relevant to agriculture sector in Malaysia and this subsector is essential to ensure national food security. To fulfill the nation objective, there are eight main paddy granary areas which responsible in producing the rice for Malaysia. The total area of paddy field according to Ministry of Agriculture and Agro-based Industry was calculated to be 674,928 ha in 2009 of which 515, 657 ha were located in Peninsular Malaysia and the others were located in Sabah and Sarawak. The biggest granary area was located in MADA supervision is about 193,095 ha and the smallest granary area is in IADA 5,952 ha.

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Trend in paddy production over 2005 to 2010 reveal that production of paddy per metric tonne increased by 9.2%. The production of paddy in term of value also increase from RM 1,272,700 to RM 1,911,000 respectively brought to an increment about 33.4% (Table1).

Muda paddy farming's area was known when Muda Irrigation project started, the purpose of this project is to supply enough water to the paddy cultivation in Muda area, this development project was cost RM 204 billion (1965~1970). Total area of paddy cultivation in Muda area according to MADA administration in Kedah and Perlis is 96,558 hectare.

The Muda Agricultural Development Authority (MADA) administrative area is under 27 areas of irrigation supplier (A1-E1, A2-H2, A3-F3, and A4-F4). There has 27 PPKs (Pertubuhan Peladang Kawasan) in the Muda Area which responsible to provide several of services to farmers such as supplying farm machineries, selling seeds, pesticides and herbicides, protect the interests and right of the farmers. Region 1 in Perlis has five (5) PPKs, Region 2 in Jitra has nine (9) PPKs, Region 3 in Pendang has six (6) PPKs and lastly in Region 4 in Kota Sarang Semut has seven (7) PPKs.

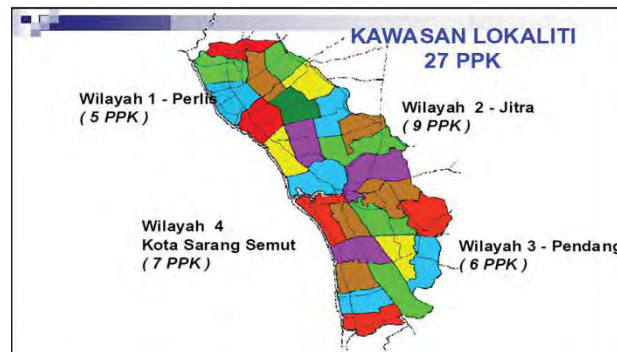


Figure 1: Muda paddy farming area (Source: MADA website)

Farm Mechanization and Technology Innovation in Muda Paddy Farming Area

Increase in agricultural production is important factor to usher in rural prosperity. Agricultural mechanization improves production and productivity; post-harvest processing, either primary or final, adds value to the produce. This section tried to discuss about the role of farm mechanization in changing the agriculture sector scenarios.

Sharma et al. (2004), "The use of mechanical power is becoming indispensable for making an optimal use of resources and in-time completion of various farm operations under intensive agriculture. Hence, mechanization has become a very crucial input to further the development of agriculture. Mechanization saves time in completing different

operations, which give the crop more time to mature; allows the farmer to be more flexible in his farming operations; and facilities multi and relay cropping”.

Agricultural mechanization embraces the use of tools, implements and machines for agricultural land development, crop production, harvesting, and preparation for storage, storage, and on-farm processing. It includes three main power sources: human, animal, and mechanical. The manufacture, distribution, repair, maintenance, management and utilization of agricultural tools, implements and machines is covered under this discipline with regard as to how to supply mechanization inputs to the farmer in an efficient and effective manner (Adrianus G. Rijk, 1997).

While according to Joginder Singh (2000), farm mechanization has been helpful to bring about a significant improvement in agricultural productivity. Thus, there is strong need for mechanization of agricultural operations. The factors that justify the strengthening of farm mechanization in the country can be numerous. The timeliness of operations has assumed greater significant in obtaining optimal yields from different crops, which has been possible by way of mechanization.

Farm Mechanization And Technology Innovation Are Very Significant To Paddy Farming Development In Muda Area.

TABLE 2: HISTORY OF TECHNOLOGIES INNOVATION AND MECHANIZATION IN MALAYSIA

Year	Major Project
1973-1977	Mechanization of rice cultivation in the Tropics
1978-1982	Mechanization of farm operation in the paddy growing areas in the Tropics
1983-1987	Promotion of rice double cropping through rationalization of system water management and farming system in the lowland area of the Tropics
1985-1989	Crop disease and insect control for double cropping of rice in the Tropics
1988-1992	Promotion of rice double cropping through direct-seeding culture in the Tropics Development of methods of control of biotic agents injuring rice plants under direct seeding culture in Malaysia
1993-1997	Development of performance-oriented water requirement model for large-scale paddy fields in Malaysia

In 1960 double cropping was widely introduced in Muda Area with the objective to increase food production and income level of the rural poor (JIRCAS, 2004). At early stage, double cropping system is practiced in whole of Muda area use of transplanting techniques, but after 1980, almost of 80% to 90% area of Muda Area shifted to the direct seeding techniques in both of cropping seasons.

There have four (4) techniques of direct seeding reported by MADA, includes wet seeding, water seeding, dry seeding, volunteer seeding. The expanded of direct seeding in

Malaysia began in the late of 1970s, and 90% of main granary area had applied that in the field (Heong, et al. 2005).

The use of machinery at present is important to facilitate the work on the farm and reduce the manpower especially in the early stages of land preparation and harvesting. Before the introduction of machinery, animal and human energy is widely used. After the paddy planting system introduced twice a year, then the demand for labor is high, in order to increase the capability in doing farm activities quickly and on time. Since the working efficiency needed in this system, the uses of machinery became necessary to expedite the process, particularly in land preparation and paddy harvesting.

The government's mechanization and infrastructure programs have increased irrigated land area to 340,000 hectares in 1995 from 320,000 in 1980 while the number of agricultural tractors leaped to 43,295 in 1995 from barely 7,430 in 1980, which greatly contributed to the increase in the country's rice productivity. Technological interventions, largely through mechanization and introduction of modern rice varieties, as considered the key factors that contributed to Malaysia's increasing rice yields.

The entry of agricultural machinery in rice Malaysia started in early 1970's. According to the JIRCAS Report (2004), history of use of agricultural machinery in the area of rice cultivation in Malaysia started in 1973 until 1977. In 1978 until 1982 the development of agricultural mechanization in rice farming area are spread more widely (Table 2). Extensive use of machinery in rice cultivation process has reduced the use of animal power and labor and expedites field operations.

According to a study done by the MADA, the uses of machineries in rice field activities based on 675 selected respondents, showed that 675 respondents (100%) using the machinery for the preparation of land, 659 (97.6%) respondents use the machinery during the activity of spreading the seed and application of fertilizer. Almost 564 respondents (83.6%) using a mechanical machine in farm activities, the number of respondents who use the machinery of the herbicides, pesticides, insecticides application and harvesting activities are respectively 85.9% and 100% for the overall regions in MADA (MADA Report, 2008).

Definition and Term of Custom Farming, Custom Hiring and Service Providing

Agricultural mechanization helps in increasing production, productivity and profitability in agriculture by achieving timeliness in farm operations, bringing precision in metering and placement of inputs, reducing available input losses, increasing utilization

efficiency of costly inputs (seed, chemical, fertilizer, irrigation, water etc.), reducing unit cost of produce, enhancing profitability and competitiveness in the cost of operation.

However, these inputs of farm machinery are very capital intensive and majority of our farmers do not get the desired advantages in view of the shortage of capital with them to acquire these assets. Therefore, custom hiring service is important to the farmers.

The term of custom farming is varies according to countries and researchers and field of focus or topic. Some defined it as custom hiring, farm service providing, agriculture outsourcing and agriculture contracting.

Beaton et al. (2003), "Farm machinery is a vital part of most farming operations; from the physical work it performs in the production process to the enjoyment provided form its operation. For producers, landowners, or farm management who do not have the capital, time or desire to perform machinery operations themselves, hiring custom operator to perform machinery operation is an alternative method of obtaining machinery services".

Keeney and Kemp (2002) commented that custom hiring of some fieldwork can be beneficial to some farm operations as a way to reduce machinery needs and also free up time for other farming activities. The key to success with custom hiring is to contract with good reliable operators who are interested in helping meet your operations needs.

Dollar Farm, LLC, (2005) quoted that custom farming allows for landowners to continue to manage their farms without the investment of major equipment, time and other financial resources. This alternative allows landowners to retain close control of the farming business, make all of the farming decisions, and retain all income from sales without having to perform day-to-day activities or providing/investing in equipment and labor.

Jack M. Payne, (2008) mentioned that traditionally, a custom farming agreement involves the landowner making a fixed cash payment to the custom operator in return for doing various field operations. This is either contracted individually on each field operation or in total for all growing and harvesting operations.

William M. Edwards and Darnell Smith (2006) commented about custom hiring agreement where the landowner (farmer) makes all the farming decisions, arranges for and pays for the purchase of all inputs, and receives all the income from grain sales. The landowner and the custom operator agree to have one or more custom operators perform the machine operations. The landowner agrees to pay a custom fee to the custom operator upon the completion of each machine operation.

Dadhich et al. (2009) discussed about the need and dependency of custom farming and they urged that low investment capacity of the farmers resulting from small and fragmented landholding and lower levels of agricultural production and economic returns limiting the economic incentive of the farmers to own and operate the agricultural machines in their own field in developing and underdeveloped nations. Annual hours of use in small landholding and low cropping intensity do not justify the ownership of tractor and tractor-based machines by most farmers. The farmers, therefore, have been depending on custom hiring of tractor and tractor based machines and equipments to accomplish the farm operations.

While, Beaton et al. (2003) opinioned that custom farming may be a method to spread fixed costs of machinery over more acres, reducing per unit costs and increasing cash flow. Regardless, whether a business is a user or provider of machinery services, determining a rate to charge for machinery services can be difficult due to the various costs of farm machinery.

According to Dartt, B. and Schwab, G. (2002), the custom work phenomenon has the potential of being a win-win event for both the buyer and seller of the machine service. The custom work package usually includes the machine, operator, fuel, and repairs required to keep the machine operating. Hiring custom work services enables farmers who have limited time, skills, investment capital, and/or land base to employ modern machine technology. For the owner of the machine, performing custom machine services can provide supplemental income in situations where excess labor and machinery capacity are available. She added that because there is no standardized market structure for machine services, determining a fair price for custom work continues to be difficult. Economics suggests that the price should be a function of the demand for and the supply of the custom work services available. Because the transportation cost of the machine service is high, relative to the potential income earned, the geographical market area for many machine services is quite limited.

Regarding the factors that influence the farmer decision whether to choosing the custom farming or not Igata et al. (1997) determined there has several factors influence farmers to choosing custom farming service to perform they farm activities such as because of farm size, diversification, cultural factors, labor shortage and machinery ownership. He added that the decision to choose this service is because of the farm size is different at each famer. More than 80% of farmers used contractors and farm size is an important indicator

for clarifying the characteristic of service provided by custom farming. Large farm tended to supply highly specialized services such as drainage, hedging, and spraying and small farm tend to demand for less specialized task such as sowing, ploughing and harvesting. Large farm has availability to offer small farm machinery service because they have expertise in handling modern machineries. Besides that, increasing of part time jobs and increasing in wages have in direct influence on custom farming service. In addition, another important indicator is diversification; it is happens when almost of the farms activities basically were outsourcing from generation to generation because it's cheaper and reducing time. And two others indicators are machinery ownership, if farmers have machineries they more prefer do they farm activities itself rather than hiring custom farming. Lastly cultural factors, it depends on the farming traditions as follow from generation to generation until now.

There has several characteristic influencing farmers' decision in farm management, the newest element influence farmer as decision makers are social life include the local culture, attitude of trusted friends, the policy environment, level of extension and the structure and impact of a range of institution (Guerin and Guerin, 1994; Neupane et al., 2002; Mathijs,2003; Solano et al., 2003). Subsequently, education, gender, attitude to risk and personality (Jones, 1963; Bowler, 1979; Brotherton, 1989 and 1991; Nkonya et al., 1997; Willock et al., 1999b; Vanslebrouck et al., 2002; Sheikhet al., 2003) also are the most important factors influence farmers decision. Other than that farm type, farm size and debt to asset ratio (Jones, 1963; Potter and Gasson, 1988) also influence farmer decision making in managing farm.

Custom Farming System in Muda Paddy Farming

Custom farming system can be simplified as a unique relationship between farmers and service provider in this relationship, the existence of broker/contractor as middleman is intend to be a manager between farmer and service provider. Figure 2 explains about custom farming system starting from the request of machinery services by farmers such as rice transplanter for paddy planting, combine harvester for harvesting activities and lorry or truck for paddy transportation from service providers.

Service providers can be categorize to several type according to the service provided by providers as: 1) only provide tractor service provider; 2) provide tractor and lorry service provider; 3) provide tractor, lorry and harvester service provider; 4) provide tractor and

harvester service provider; 5) only harvester service provider; 6) only provide lorry service provider; and 7) above mentioned service provider cum broker.

While role of brokers is managing or arranging the land preparation and harvesting schedule, transportation, payment, job agreement and mostly become representative of the farmers and service provider. The broker is also known as linkager, manager, networker, supervisor and others.

The types of brokers are classified as: 1) only just a broker; 2) broker cum farmer; 3) broker cum farmer and harvesting machine/lorry/tractor owner; and 4) broker cum owner of harvesting machine/lorry/tractor owner. Brokers is usually a villager who staying in the same area of farmers and will handle the job in his area or nearest his residential. One broker will work under one service provider or two depend on the service provide. Brokers will be given commission upon their coordination of the services by providers. Figure 2 explains how the custom farming system works.

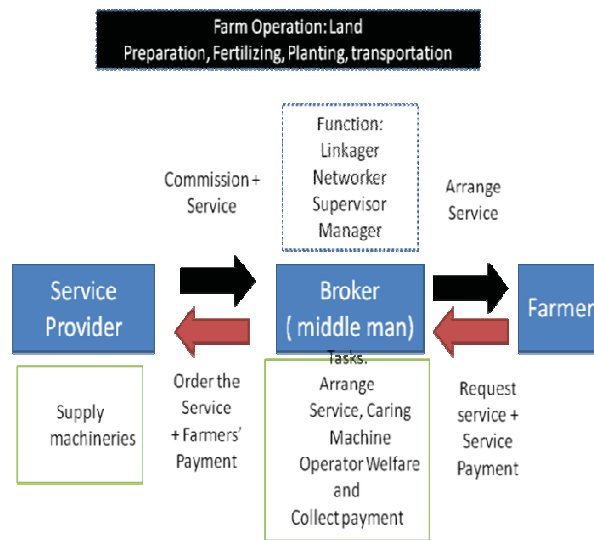


Figure 2: Custom Farming System

Problem Statement

Paddy farming system has changed from agricultural systems from single cropping to double cropping. Manual transplanting also converted to direct seeding systems. There are “Berderau” system and operating systems that use energy of animals and a large labor force was changed after farm mechanization. The changes of “Berderau “system to the of

farm machinery system has been able to save many of the labor force. The conversion to this system is affected by the migration of rural labor to cities.

Average land holding of Muda's farmers is less than two (2) hectares and the average yield are 4-5 tonnes per hectare. Because of the economical reason there are not afford to buy own machineries. Although there are farmers who are able to have the machines, but they try avoiding the risk and these reasons influence the farmers to contracting out their main job of farm activities to service provider. The service providing system or known as custom farming was practicing many years ago and has been introduced in Muda Area since at the end of 1979 and become part of the contributor to paddy farming and agriculture development in this granary area.

There has long been a known dependency on external contracting (farm custom-hire) by farmers generally, but the scale of agricultural contractor-use has been infrequently measured. While dependency upon the services provided by agricultural contractors is well known to agriculture agency especially MADA's extension agents and Muda's farmers, the sector has received relatively little research attention. Actually, there have a huge effect of this system to the agriculture system, especially in agribusiness and agriculture economic in Muda Area particularly in estimating the production cost, risk deduction, transaction cost economics and so forth. Therefore, the study should be done to get a true picture of how this system is works.

The purpose of this study was to identify the general system of providing services in paddy farming in the Muda area. Specifically, the objectives are: 1) To identify the profile of the respondents among the brokers, farmers and service provider; 2) To examine the operation or practices of custom farming or service providing system; and 3) To determine the current status and role of brokers and providers in paddy farming management.

Methodology

Primary data was obtained directly through face o face interview using questionnaire and 170 respondents among paddy farmers in study location Muda Area were chosen using stratified random sampling. A questionnaire was prepared in accordance to the study objectives. The collected data was analyzed to test the various hypotheses. The data was analyzed according to the demographic and frequency analysis so as to recognize the characteristic of respondents. SPSS software was used to analyze the collected data using descriptive analysis and correlation analysis.

Results and Discussion

Respondents' Background: Age And Education Level

Table 3, depicts the socio-demographic profile of the respondents which is focusing on age and education level. It clearly showed that in age, the bulk of Malaysian granary area's farmers are in the senior category and the mean age of 53.8 years of age among the farmers of this study displayed. Majority of them are the older citizens. It seems that Malaysian context the senior citizens dominate the paddy farming sector whether in service providing scope. On top of it, in terms of the level of education, most of the farmers did not have a high level of education as more than half of the respondents had come from secondary school which is 65 respondents study until SPM level, 35 (20.6 percent) persons from PMR level, and 31 (17.6 percent) respondents learning until standard 6. Looking at high level of education, the data indicated that only 17.7 percent respondents come from higher education level which is 30 per 170 respondents of the data.

Respondents' Opinion Toward Service Providing System

Reason of Services Requirement from Providers

Table 4 show that there are three main reasons why the farmers wanted to get services from providers. The highest reason is they can't afford to buy machine, tractor or lorry. From the total respondents, 125 of respondents (73.5 percent) state this reason. The second highest reason is lack of time and energy about 91 (53.5 percent). The other reason is they are afford to buy, but don't want to get involved in debt risk and management. This reason shows about 80 (47.1 percent).

Table 3: Demographic Profile of Respondents

Category	Farmers	
	Frequency (n=170)	Percentage (%)
Age		
20 year and under	1	0.6
21-30 year	7	4.1
31-40 year	12	7.1
41-50 year	54	31.8
51-60 year	45	26.5
61 year and above	51	30.0
Ave.= 53.8 Standard Dev.= 11.7		
Education Level		
Not Schooling	2	1.2
Pondok/ Religious/Adult Classes	8	4.7
Standard 6		
SRP/PMR	31	17.6
SPM	35	20.6
Certificate/Diploma	65	38.2
Bachelor	18	10.6
	12	7.1

The Benefit From The Service Providers

From the Table 5, the highest benefit from the service providers is the whole task become easier and faster rather than self doing (95.9 percent). The second highest benefit is lessening risk in managing the paddy field and machine ownership shows about 74.1 percent. The others benefit is gain knowledge and get the technology services and latest machineries presented by providers (47.6 percent). The lowest benefit is opportunity for farmers in becoming the owner of the machines/tractor/lorry/hired worker (30.6 percent).

Table 4: Reasons of Services Requirement From Providers

Reasons	Frequency (n=170)	Percentage (%)
Can't afford to buy machine/tractor/lorry	125	73.5
Lack of time and energy	91	53.5
Afford to buy but don't want to get involve in debt risk and management	80	47.1
Others	18	10.6

Table 5: Benefits from The Service Providers

Benefits	Frequency (n=170)	Percentage (%)	Ranking
The whole task become easier and faster rather than self doing	163	95.9	1
Farmer can get credit facility/loan from broker and machineries/lorry owner	69	40.6	5
Farmer can get part time job (broker/operator/hired worker)	76	44.7	4
Opportunity for farmers in becoming the owner of the machines/tractor/lorry/hired worker	52	30.6	6
Lessen risk in managing the paddy field and machine ownership	126	74.1	2
Gain knowledge and get the technology services and latest machineries presented by machine owner and the broker	81	47.6	3

Conclusion and Recommendation

There are three (3) reasons why the farmers need the service from services providers. The highest reason is they can't afford to buy machine, tractor or lorry. This shows about 125 (73.5 percent) of the respondents states the reason. With small land size in average below 2 hectare and average yield between 3 to 5 tons per hectare, almost the Muda area's farmers not economically to purchase, maintain and running the big machinery like combine harvesters. Even if they afford to do that, the farmers can make a decision not to purchase the machinery except the machinery for minor farming activities and they are able to avoid the risk in machinery management by outsourcing the farming activities that need to be implementing using the machineries.

The highest benefit gained from the service providers to the farmer is the whole task become easier and faster rather than self doing (95.9 percent) respondents. It's meaning more to the benefit get from the farm mechanization and technology innovation where the introduction of farm machinery can save their energy and time spending in farming activities, lessen risk in farm management and reduce the using of labor in farming operation which the labors is the critical issues in paddy farming.

There is still much improvement that can be made in the service providing system. The system could be is improved by the introduction of a better agreement with the farmers

and machines owner and the service providers' responsibility toward post harvest losses and custom rate.

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Table 1: Main Information of Malaysian Paddy and Rice (2005-2010)

Items	2005	2006	2007	2008	2009	2010
Area planted in parcel (hectare)	440,961	429,805	426,224	426,412	426,031	428,780
Area planted (hectare)	666,781	676,074	676,111	656,602	674,928	673,745
Production ('000 Tonne Metric)	2,314	2,187	2,375	2,353	2,511	2,548
Production value (RM '000)	1,272,700	1,421,550	1,543,750	1,764,750	1,883,250	1,911,000
Average yield (Kg/Ha)	3,471	3,236	3,514	3,584	3,720	3,782
Rice Production ('000 Tonne Metric)	1,490	1,407	1,531	1,516	1,620	1,642
Total import rice ('000 Tonne Metric)	585	843	799	1,093	1,130	570 ²

Source: DOA, 1 DOS

Note: Paddy parcel is a piece of land usually use in paddy planting

² Data Jan –June 2010