

**AGRICULTURE IN MUDA AREA FOR NATIONAL FOOD SECURITY**  
**AGRICULTURE DANS LA ZONE MUDA POUR LA SECURITE**  
**ALIMENTAIRE NATIONALE**

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**ABSTRACT**

*Rice is the main crop in the Muda Area. Competition of water resources in the northern region of Peninsula Malaysia as well as rapid development in land usage have been the two challenging issues since double cropping was introduced. After commissioning of the project in 1974, it embarks a new era in irrigation and drainage development in the country's national development plan. Farmer's participation in the early days of development is rather minimal although in the tertiary development the farmers' opinion was sought in the design, operation and maintenance of the tertiary irrigation and drainage infrastructures. However the voluntary participation of farmers to operate and maintain the infrastructures leaves much to be desired. Commercially viable group farming is increasing although majority of the farmers still practice individual outsourced farming until today. The full participation of the present generation of farmers in the group farming commercialization project is vital for sustainable rice production in the Muda Area. A New Agriculture strategy of the Ninth Malaysia Development Plan to increase paddy production by the participation of group farming through commercialization with target to increase production. The Government strategy by investing in the largest granary of the country does benefit the farmers in term of poverty alleviation and improvement of quality of life. This investment will continue as the country depends on the Muda Area for rice production to achieve the National Self Sufficiency Level (SSL) of rice production to 83% in 2020.*

**INTRODUCTION**

Irrigated agriculture in paddy cultivation on a large scale in Malaysia started since independence in 1957. With the irrigation development in the main granary areas, government efforts seem successful to increase food production and improving the economic status of a large numbers of farmers. The priority of development was to provide basic irrigation infrastructures which consist of a network of canals and drains, control structures and farm roads to areas producing staple food for the country.

Muda Irrigation Project, being identified as the largest granary and irrigation development in the country with a total development cost of RM204million (1965~1970) has produced more than 27 million tons of paddy at farm level. Provision of infrastructural development in irrigation projects without addressing the human needs bounds to have problems of implementation. Thus the need for irrigation extension was realized in the early stage of the implementation of the irrigated agriculture development.

In the pre-Muda era, farmers helped out each other in the single cropped paddy planting activities which is wholly dependent on the rainfall. When modern irrigation facilities were provided and double cropping introduced, farming activities like transplanting and harvesting were still labor intensive while mechanized land preparation was introduced and more recently by mechanical transplanting.

Water shortage has been identified as a threat to sustainable rice production in the Muda area. The increase demand in domestic and industrial growth due to population growth and opening up of new growth and industrial area in its surrounding area is of great concern and must be well managed in order to sustain rice production.

A good water governance practices on water use in the Muda Area and its surrounding area of Northern Corridor Economic Region (NCER) implemented in 2007 needs to be spelt out in line with the National Water Policy and National Agriculture Policy for a sustainable development of the region. Steps to increase water efficiency in agriculture water management practices are needed to minimize wastage. Implementing a zero drainage concept in an irrigation block is worth an investment for future water resources development.

This paper discusses issues related to water management practices through participatory irrigation management (PIM) and efforts on infrastructure development intensification in the Muda Area to sustain the objective of rice production for food security supporting the human living and environment in Malaysia.

## **GOOD IRRIGATION PRACTICES IN MUDA AREA**

### **Participatory Irrigation Management (PIM)**

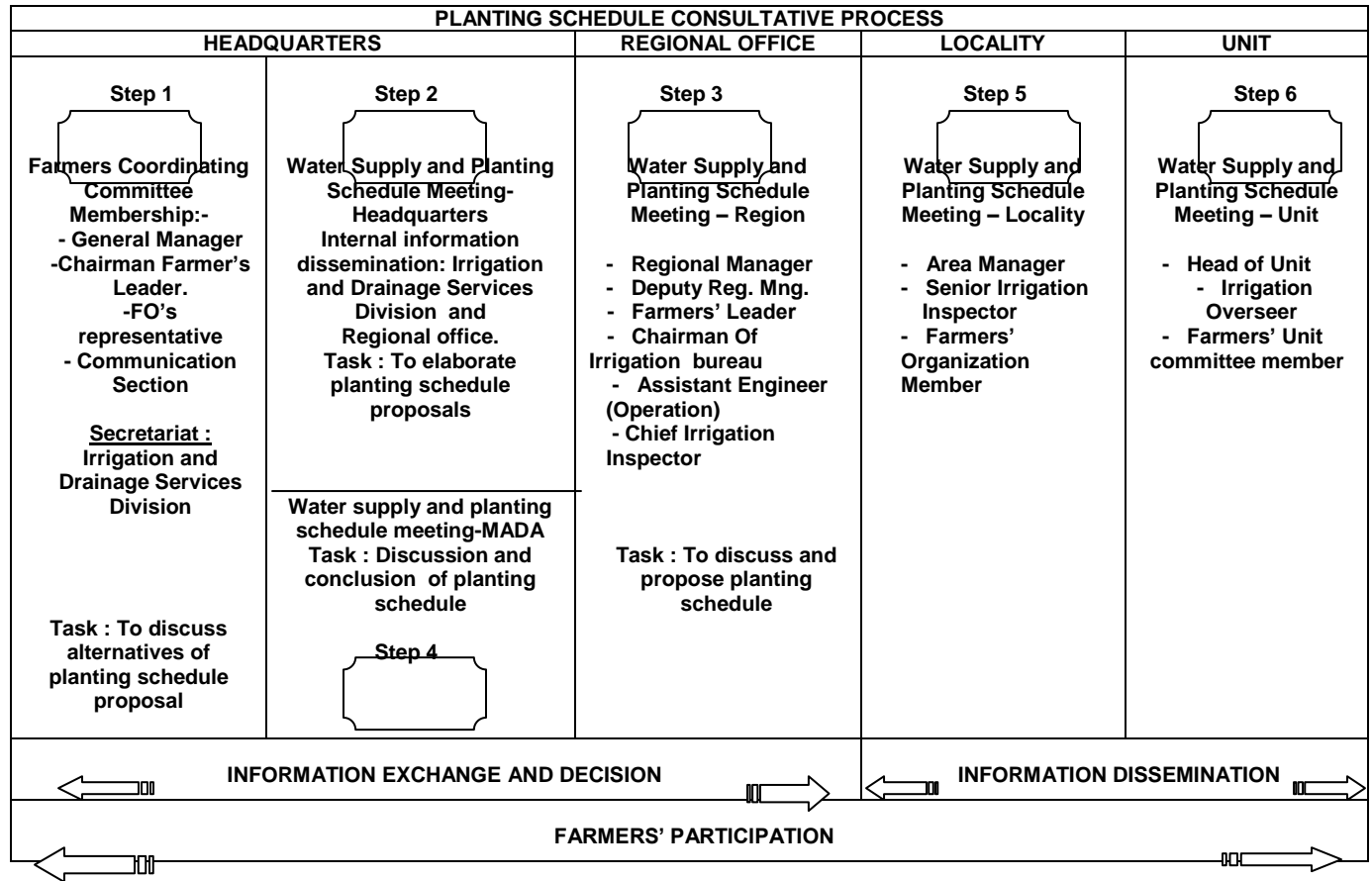
The success of irrigation management of Muda Area since its inception in 1974 lies in the consultative process between the MADA's management with Coordinating Committee of farmers' leaders from the Farmers Organization Area (FOA). The consultation between MADA and FOA discusses policy matter regarding agriculture for the benefits of both parties.

The main agenda on the consultation is to fix the planting schedule before each season starts. The consultative process can be summarized in Figure 1. The consultative process takes place at four different levels, the headquarters, regional, locality and unit. The crucial process is at Step 1 to Step 4 (in Figure 1) where decision on the planting schedule starting date is made. At Step 5 and Step 6 the farmers at the locality and unit are informed of the planting schedule decision.

This consultative process for planting schedule is part of the procedure in the Quality Management System (QMS) of MADA's organization. The implementation of the QMS in 2000 has further encompassed PIM in Muda Area as the system mandatory requirement of customers' satisfaction on irrigation management services included in the QMS.

The meeting for the consultative process normally occurs twice a year before the starts of each season. The first season also known as the "off-season" normally starts in Mac with harvesting normally occur in July. The second season (main season) normally starts in August and harvesting starts as early in December the same year. This meeting also provides a platform for direct feedbacks from the farmers' to MADA's management.

**Figure 1: Planting Schedule Consultative Process**



Further improvement of participatory irrigation management (PIM) in the Muda Area may follow the two proposals listed below:-

**a) Building capacity for capable Water User Association (WUA)**

Building capacity for a capable water user group should be based on the country fifth national mission, “to strengthen the institutional and implementation capacity”. It is envisaged that the formation of the WUA with the emphasis on in-field water management should arrest the issues of allocation, efficiencies, liberalization of economies, enhanced and enlarged participatory approach in decision making, irrigation management transfer and perhaps a new institutional arrangement.

There are eight Water User Association (WUA) formed in the year 2006 with group farming in the sub-area, of the total 173 irrigation blocks in the Muda Area. The status of the pioneer group farming and WUA is highlighted in Table 1. The WUA is located in irrigation blocks which comprise of an area between 500 to 1500 hectares. The sub-area which contains the formation of group farming and WUA forms only one percent of the irrigation block.

Table 1: Status of Group Farming and Water User Association in Muda Area in 2006 (Source: MADA)

Region	Irrigation Block (ha)	Sub-Area (ha)	No. of Farmers	Remarks
I	ARBD2 (465ha) ALBD4 (777 ha)	ARBDr2 (24ha) Chemumar (57 ha)	18 45	Tertiary facilities Tertiary facilities
II	NCD2b (122ha) ACRBD1 (650ha)	- -	85 450	Tertiary facilities Non-tertiary
III	CCRBD2-1 (168ha) CCRBD10 (487ha)	Pdg. Langgar (93ha) Jelai (153ha)	114 101	Non-tertiary Non-tertiary
IV	SCRBD7b (834ha) CCRBD11 (683a)	Sg. Limau (285ha) Kepala Parit (89ha)	188 56	Non-tertiary Non-tertiary

Since the formation of the pioneer group farming and incentives given to the formation group farming, the area of group farming with WUA has increased. The recent data on group farming and WUA is highlighted in Table 2. The area of the group farming has increased to more than 13,000 hectares at the end the main season 2009. The area of group farming with WUA formation in the small farming unit (SFU) is targeted to increase to 20,000 hectares in 2010.

Table 2: Recent status of Group Farming and Water User Association (Source: MADA)

Year	Region							
	I		II		III		IV	
	No. of farmers	Area (ha)	No. of farmers	Area (ha)	No. of farmers	Area (ha)	No. of farmers	Area (ha)
2007	806	1060	451	688	343	384	94	176
2008	761	1131	1291	1855	1317	1738	900	1476
2009	264	498	1526	2267	732	1194	335	669
2010*	1882	2745	3125	5078	2392	3289	2357	4184

Note: \*until season 1/2010

The objective of building a capable WUA is finally to transfer the “ownership” of the operation and maintenance of irrigation infrastructure to the farmers themselves operating by a central management farming community in a competitive liberalized economic environment. The Government should allow a conducive enabling environment for farmers’ organization to adopt themselves by introducing policy changes in managing the country water resources in a holistic manner.

As Muda Area is the major contributor/player of irrigated agriculture in the country, the options to manage the water resources available for water savings and conservation needs a policy review for the benefits of other consumer in the region. A comprehensive framework of a regulating charter should encompass an integrated approach which covers the inter sector of use of water resources, water efficiency and water conservation needs in the Muda Area.

## **b) New irrigation method in water seeding**

Direct seeding in standing water should be the water saving method of irrigated agriculture in the granaries of the country. By application of this method the water requirement for crop establishment can be reduced. Initial studies at MADA's training plot shows that water seeding can save water up to 12% when compared to the wet seeding planting method. Emphasis on prudent water management in the paddy field is the key to water savings.

The new irrigation method should be the choice to conserve water in the Muda Area to be applied in the paddy field. The emergence of mechanical transplanting which also require no standing water to allow trans-planter to transplant the seedling does have some impact to the farming community in term of production cost. Additional cost in paddy production will be incurred if this new machine will be widely used in the Muda Area. Planting by mechanical trans-planter seem to be the same as wet direct seeding where MADA's water management practice is concerned.

## **Intensification of Farm Level Infrastructure to Tertiary Level**

The rice production in the Muda Area took tremendous leap after the implementation of major infrastructure work in 1970. Physical work for the project began after the acceptance by the Government on the feasibility study for the Muda Irrigation Project in 1964. After the completion of consultancy report international tenders were called. A World Bank loan was successfully negotiated by the government to finance the project. Construction work of the two dams (Muda and Pedu) started in 1965 and completed in 1969. The construction of the reticulation works began at the same time of the construction of the dams and was completed in 1970.

The present irrigation, drainage and road network infrastructure development during the Muda Irrigation Project and the subsequent tertiary development irrigation (1979-1985) are tabulated in Table 3.

Table 3: The Physical Irrigation Infrastructures in the Muda Area (Source: MADA)

<b>Irrigation System</b>		<b>Drainage System</b>		<b>Field Roads System</b>	
a. Dam	3 nos.	a. Primary drain	240km	a. Secondary farm road	770km
b. Primary canal	146km	b. Secondary drain	865km	b. Tertiary farm road	868km
c. Secondary canal	965km	c. Tertiary drain	562km		
d. Tertiary canal	764km				

The gross paddy yield at farm level prior to the availability of irrigated agriculture facilities was 3.2 tons/ha. Measures undertaken by providing structures for irrigation and drainage and supplemented with providing terminal facilities for irrigation at farm level has significantly increased the production of paddy in the Muda Area. The production statistics of rice since 1970 to 2009 are shown in Table 4.

Table 4: Paddy Yield (ton/ha) in the Muda Area (1970 – 2008) (Source:MADA)

Year	Average (tons/ha)		Total Area Planted (ha)	Total Production (ton)	Income Generation (RM)
	Main Season	Off Season			
Before 1970	3.286	-	479,275	1,568,859	418,257,809.40
1970 – 1975	3.843	4.049	963,516	3,782,598	998,984,131.80
1976 – 1980	4.254	4.486	834,610	3,632,824	959,428,818.40
1981 – 1985	4.252	3.619	897,452	3,547,451	1,759,890,441.10
1986 – 1990	4.573	3.511	940,540	3,815,556	1,892,897,331.60
1991 – 1995	5.274	4.201	956,453	4,538,522	2,251,560,764.20
1996 – 2000	4.764	4.721	963,329	4,568,303	2,512,566,650.00
2001 – 2005	4.941	5.660	963,473	5,078,512	2,793,181,600.00
2006 – 2009	5.163	5.998	771,998	3,956,987	2,967,740,250.00

Note: Interval of 5 years was used;\*Estimated Production until Season 1/2008;Unit Price of Paddy/ton, 1970-80 RM264.10,1981-95 RM496.10,1996-2005 RM550,2006 RM650, 2008 RM750

Table 5 below shows the eight granaries contribution on rice production for the country. Muda Area (MADA) produces nearly 40% of the national rice production though Muda Area only constitute an area of 23% of the country total rice growing area.

Table 5: Rice Production From Granary and Non-granary Area in Malaysia 2007-2009\* (Source: Department of Agriculture)

GRANARY AREA	PARCEL AREA (ha)	% AREA	CONTRIBUTION TO NATION PRODUCTION (ton and %)					
			2007		2008		2009*	
			ton	%	ton	%	ton	%
MADA	96,558	23.22	874,550	36.81	887,992	37.74	976,192	38.90
KADA	32,167	7.74	188,645	7.94	179,048	7.61	209,950	8.37
PKSM	27,829	6.69	175,482	7.39	169,753	7.21	187,117	7.46
PBLS	18,482	4.45	184,115	7.75	174,247	7.41	202,633	8.07
P.P.P.B.P.PINANG	10,305	2.48	100,041	4.21	98,436	4.18	107,285	4.28
SBG. PERAK	8,529	2.05	47,258	1.99	62,076	2.64	70,294	2.80
KETARA	5,156	1.24	42,707	1.80	46,097	1.96	49,082	1.96
KEM. SEMERAK	5,220	1.26	13,651	0.57	14,757	0.63	16,853	0.67
<b>TOTAL GRANARY</b>	<b>204,246</b>	<b>49.12</b>	<b>1,626,449</b>	<b>68.46</b>	<b>1,632,406</b>	<b>69.37</b>	<b>1,819,406</b>	<b>72.50</b>
<b>TOTAL - NON GRANARY</b>	<b>211,545</b>	<b>50.88</b>	<b>749,155</b>	<b>31.54</b>	<b>720,626</b>	<b>30.63</b>	<b>690,072</b>	<b>27.50</b>
<b>MALAYSIA</b>	<b>415,791</b>	<b>100.00</b>	<b>2,375,604</b>	<b>100.00</b>	<b>2,353,032</b>	<b>100.00</b>	<b>2,509,478</b>	<b>100.00</b>

## SUMMARY AND CONCLUSION

Irrigated agricultural development in Muda Area provide basic irrigation infrastructures which consist of a network of canals and drains, control structures and farm roads to areas producing staple food for the country. Initially Muda Area was provided with infrastructure at a density of 10m/ha only. Realizing the inadequacy of infrastructural density in Muda Area, about a third of its area was later provided with tertiary irrigation and drainage infrastructures with a density of 30m/ha. Farmers' involvement takes central role in the tertiary development where their participation in the design, operation and maintenance of the tertiary irrigation and drainage infrastructures were sought.

The parallel formation of Farmers' Organization Association (FOA) with the Muda Agricultural Development Authority (MADA) when the projects started, allows institutional development for farmers' to uplift their social and economic status through programs initiated by the Government. A new paradigm for farmers' participation through their institution to endeavor the Government mission to strengthen the institutional and implementation capacity is timely in the Malaysia Development Plan.

Water reform to provide good water governance in Muda Area and regional competitive demand of water resources due to population and industrial development in cognizance of National Water Policy is necessary. Improvement of existing PIM among the farmers institution to a new paradigm shift towards self reliance and governance among the farming community would reduce Government maintenance and operating budget. However infrastructural development should continues in the Muda Area due to inadequate delivery channels for water supply and drains to remove water from the paddy fields.

Irrigation development has been a catalyst to agriculture production of rice in the Muda Area. Further development and construction of infrastructure in the Muda Area in the form of capital expenditure by the Government and Farmers' Association Organization (FAO) take up in the commercialization of group farming is tantamount to replace the individually farmers' outsourced type of farming. To make the 'group effort' from the farmers into reality and manageable by the authorities, the farmers of the future are expected to exercise increased management capacities. The process will be supported by the advent of new generation of farmers exposed to a more diversified education.

The production of paddy from Muda Area helps contribute to the country self sufficiency level of the nation where 40% of the nation paddy production is cultivated in the Muda Area though only a third of the area has tertiary development. Intensification of tertiary system in the remaining area is set to increase the production from Muda Area with agriculture getting new mandate from the government to be the third engine of growth for the nation economy. Although Malaysia is outside the undernourished map of the world food is the basic necessity for human livelihood. Therefore rice production in Muda Area will continues to play important role in the nation development.

Muda Area future rest on good governance model for the user's satisfaction which comprise of the farmers represented by the Farmers' Association Organization (FAO) and operator of the area represented by the Muda Agricultural Development Authority (MADA). There must be people to sustain the system, and these people must feel motivated to fulfill their role.

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