

**KULIM – BADANG SYSTEM  
A LOW COST APPROACH IN FFB EVACUATION**

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In a world where things are rapidly changing, CONTINUOUS IMPROVEMENT is the epitome of survival. Malaysian oil palm plantation industry is facing stiff competition from other CPO producing countries.

Increase in labour costs and escalating fertilizer prices domestically are pushing the cost of production higher. As Kulim (M) Bhd is strategically positioning itself as a global oil palm plantation player, a proactive approach is required to stay competitive hence survive.

**THEN**

In the annals of Malaysian plantations history, Kulim(M) Bhd will always be remembered for its innovation of Kulim System of FFB evacuation – lorry mounted cranes loading from FFB nets. Along the years, these lorries were replaced with tractor-mounted cranes due to some problems with the former. Shuttling tractors and detachable trailers were also introduced to improvise the system further.

The improvised system requires skillful mechanics to maintain and repair tractor cranes and trailers. Excellent logistics management is a requirement. Down time simply means backlogs in the field, un-useable nets and repeated handling all of which contribute to higher costs and poorer crop quality. Of utmost importance is the crane as minor repairs must be treated with exigency. The crane is the HEART of Kulim system.

**PRESENTLY**

There is no doubt that the above system is simply brilliant. However, the recurring problem with the cranes thus higher operational cost is of great concern. There is a strong need to find an alternative.

We, at Ladang Sedenak, acquiesced with this and decided to embrace the idea mooted out by Executive Director En Mohamed Sohor. KULIM –BADANG system is an efficient yet a low cost approach in FFB evacuation. A pilot project has been carried out in Ladang Sedenak by constructing mini ramps in fields P83 (559.74ha) & P90 (56.21 ha) to cater for the above system. The most striking aspect of this concept is that it is WIN-WIN in nature in which it helps the estate with a lower cost FFB evacuation and concurrently a good marketing platform for BADANG – our group product.

Though we managed to come up with a successful first version (Operational since March 2003), we compellingly felt that enhancement is needed – “THE SPIRIT OF CONTINUOUS IMPROVEMENT” – thus Version 2.0 was born (implemented in August 2004)

This paper will explain on the workings, the cost being incurred, the productivity and the advantages of having KULIM – BADANG system for in-field FFB evacuation.

## A. VERSION 1.0

### A1. SET UP

#### STEP 1:-

- Construction of mini ramps @ an average of +/- 8 ha/ramp.
- Appropriate location must be determined to reduce traveling time and also to ensure adequate crop (+/- 1 load-7 tons within the radius of the harvesting operations).
- Simple construction of mini ramp for the trailer to be placed at a height suitable for the MB to directly unload the FFB into the trailer.

#### STEP 2:-

- The harvesting operations are as per normal practices & standards.
- The harvested bunches are transported by MBs directly to the awaiting trailers (+/- 4 units) @ the mini ramps. (MB ratio remains the same)
- The bunch counter, assisted by the stripper, checks the bunch, grade the crop, and remove the trash from the loose fruits, "ONE STOP CENTRE"
- This system also simplifies the verification of the bunch weight for every load.

#### STEP 3:-

- The empty trailers are parked @ the ramps in the areas of the harvesting for the day.
- The loaded trailer (+/- 7 tons) is then towed by the tractor to the Mill.
- The system continues.

### A2. DETAILS OF CROP AND UNIT COST:

Anticipated Yield : 24 tons/ha x 615.95 ha

$$= \frac{14783 \text{ tons}}{300 \text{ days}} = 49 \text{ tons/day}$$

The average traveling time including turn around  
+/- 1 ½ hrs x 7 trips = 10.5 hrs

$$\text{Annual running} = 10.5 \text{ hrs} \times 300 \text{ days} = 3150 \text{ hrs}$$

#### Expenditure:

$$\text{Tractor \& Trailer running} = \text{RM40568}$$

(As per attached budget)

$$\text{Depreciation – 1 un. Tractor – 72300 / 5 years} = \text{RM14460}$$

$$\text{Depreciation – 4 un..Trailer – 40000 / 5 years} = \text{RM 8000}$$

$$\text{Depreciation – Ramp – 30800 / 25 years} = \text{RM 1232}$$

$$\text{TOTAL} = \text{RM64260}$$

$$\text{Cost/Ton} = \text{RM64260 / 14783} = \text{RM 4.35/ton}$$

### A3. COST COMPARISON AGAINST CURRENT KULIM SYSTEM

1. Capital out lay for Kulim System – REM statistics

Shuttling system to cater for 50 tons evacuation:-		
1 unit shuttling tractor – 80 HP	-	RM 72,300
1 unit Ursus 4J14D Tractor c/w Palfinger Crane	-	RM106,035
FFB Trailer 2 units	-	RM 20,000
7' x 7' nylon nets = $\frac{50 \text{ tons}}{0.75 \text{ ton/net}} = 67 \text{ nets @ RM137/=}$	-	RM 9,179
<b>TOTAL CAPITAL COST</b>		<b>RM207,514</b>

2. Capital Out Lay : Kulim Badang System

P83 & P90 – 615.95 ha		
Cost of ramp – $\frac{615.95 \text{ ha}}{8 \text{ ha}} = 77 \text{ ramps @ RM400/=}$	-	RM30,800
1 unit tractor – 80 hp	-	RM72,300
Modification to trailers & new trailer cost, 4 units @ 10,000	-	RM40,000
<b>TOTAL CAPITAL COST</b>		<b>RM143,100</b>

Savings on Capital (A – B) : RM207514 – RM143100 = RM 64,414

Saving on Revenue Expenditure:

Av. Kulim System cost for REM & Pasak(2001)	-	RM 6.57/ton
Estimated Kulim Badang System cost	-	RM 4.35/ton
Savings		RM2.22/ton
Add. payment to harvesters for the delay over the direct transport Replacing the net distribution rate - RM 0.60/ton		
Actual Savings ( RM2.22 – RM0.60 )		RM 1.62/ton

14,783 tons x RM1.62 = RM23,948

TOTAL SAVINGS (CAP. + REVENUE) = RM88,362

### A4. WHY KULIM-BADANG SYSTEM?

- 1) Lower capital out lay – lesser constraint to cash flow for the company.
- 2) Lower revenue expenditure – savings to the company, enhancement for the Estate operations.
- 3) Nil Mechanical breakdown as crane system is not required.
- 4) Competent drivers not required.

- 5) Any tractor could be utilized for the new system.
- 6) B/log avoided, as the crop from the last harvesting operation is also in the trailer and not on the ground or net.
- 7) Breakdown of crane tractor effects the smooth net distribution as thus FFB at times, will be on the ground and additional handling required, but is avoided in this new system.
- 8) No night shift is required (and all FFB harvested could be safely evacuated within the operation day) thus security is also further enhanced.
- 9) “ONE STOP CENTRE’
  - a) Monitoring of FFB quality is made easier as the bunch counter and stripper are stationed at the mini ramp.
  - b) Bunches are checked and categorized accordingly.
  - c) Each trip could be monitored with accurate bunch count.
  - d) Counting of stacked bunches in the net as per old system is always difficult and could be done at random only.
  - e) Trash separation from loose fruits could be done conveniently at the Mini Ramp
- 10) Complementing the MB usage for this new system is a WIN - WIN situation for EDARAN BADANG SDN BHD and the Estate.

#### **B. VERSION 2.0**

- 1) This system was further enhanced to suit to normal terrain, flat to undulating in fields P86, P92, P92P, P99/1 and P98/1 and 2.
- 2) The height for this mini ramp is only 4 feet and only a simple construction is required.
- 3) Cost per mini ramp is @ RM 250/- as against the cost for the first version @ RM 400/unit, savings of RM 150/unit was realised.
- 4) The MBs are driven directly into the trailer and the FFB is then unloaded.
- 5) The loose fruits are unloaded over the platform and trash separation is carried out.
- 6) Soil erosion is also minimized as compared to the first version.
- 7) Reduction in the overall trailer height is noted.
- 8) The harvesting operations and the transport system is similar as per Version 1.

## **CONCLUSION**

Based on Sedenak Estate's experience in adopting KULIM-BADANG system, it is ascertained that this system is a good low cost approach in FFB evacuation. The WIN-WIN nature of this system(benefiting both the estates and Edaran Badang Sdn Bhd) makes it something worth implementing.

It is our aspiration not to be satisfied with what we have done and we are looking forward to further enhance and continuously improve not only on KULIM- BADANG system but also other areas of estate management – NOT ONLY to remain competitive but to add value to our stakeholders.

## **ACKNOWLEDGEMENT**

The writer would like to thank the following in ensuring the successful implementation of this system:

- a) En Mohamed Shor – for his wisdom guidance
- b) Mt Teo Leng – for making us think outside the box
- c) Mr Steven Tiong – his enthusiasm is a driving force
- d) Edaran Badang Sdn Bhd – for MB technical support
- e) Personnel of Ladang Sedenak – fitted like a glove