



# RESEARCH REPORT FROM MALAYSIA

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## General information concerning all machines being used in MALAYSIA

Focus Area	Number in use (amount)	Source of data	Average Age (year)	Source of data
Agricultural Tractors	15000		8	Estimate
Hand Tools	na			
Knapsack Sprayer	47,800	NAFAS	1	Estimate
Mechanical / Combine harvester	2800	NAFAS	10	Estimate
Post-Harvest Machinery	na			
Other machines	na			



COUNTRIES	Number in use (amount)	Source of data	Average Age (year)	Source of data
MALAYSIA	2800 (rice combine)	NAFAS	10	Estimate
CHINA	862,400 (wheat/rice)	MOA	5	Estimate
THAILAND	41,143 (rice combine)	MOICT	7	Estimate
RUSSIA	80,700 Grain	Rosstat, 2011 Rosagromash	70% > 10	Rosstat
PHILLIPINES	50	PhilRice <sup>6</sup> (Gagelonia, 2012 <sup>7</sup> )	3	PhilRice <sup>6</sup> (Gagelonia, 2012 <sup>7</sup> )

General information concerning combine harvesters



## MARKET FOR NEW AND RECONDITIONED MACHINERY

Item	Machinery/Implement	Number/year
1	New Tractor 50 to 90 hp	1500
2	Small (mini) tractor 15 to 45 hp	600
3	Tractors, reconditioned	500
4	Combine harvesters (recondition)	45
5	2W tractor (Power tiller)	680
6	Garden tiller	600



COUNTRIES	MACHINERY	REQ / YEAR
MALAYSIA	Rice combine	45
CHINA		-
THAILAND	Rice combine	600
RUSSIA		-
PHILLIPPINES		-

MARKET FOR NEW AND RECONDITIONED  
MACHINERY



## PADDY COMBINE HARVESTER

- » Malaysia is Fully dependent on paddy combine
- » All are reconditioned machine from imported scrap wheat combine
- » Modified locally to suit paddy
- » Major changes made on under carriage and threshing unit



# Performance VS Safety

- » Priority is performance rather than safety
- » % Grain losses must be  $< 3\%$
- »  $> 8\%$  rejected by farmer
- » Rate must exceed 4 Ha per day
- »  $> 4$  Ha, total combine wt  $> 10$  tons & may damage hard pan in low soil bearing capacity



- » Reported accidents < 10 annually, or <1 %
- » Reported injury, fatalities ~ 1 annually
- » Mostly unreported because combines not registered
- » Cannot enforce insurance scheme

# Accident & Injuries







NST 07 May 2012 >

Brake issue – overturned combine



Parking at edge at soft soil – slides into irrigation cannal



# TYPES OF ACCIDENTS



Bogged down at soft spots at low hardpan



Steering wheels get lifted while driving over buns results in header damage



# TYPES of ACCIDENTS



Walking along header (leg injury)



Falling on header while seating on grain tank can cause death



# TYPES of ACCIDENTS

Driver not aware of passenger  
dismounting



Dismount while on  
the move



Gap at unloading auger – leg injury

No protection device at auger – arm injury



TOP VIEW of Grain Tank



Worker pushes grain by leg to empty the grain tank and shirts may get caught by the unloading auger





**Dislodged steering wheel can overturn combine**



- » Matching grants to farmers for small machines only (2 wheels tractors & power tiller)
- » Government set-up agency to manage tractors and harvesters
- » Grants given to Farmers Organization to purchase Tractors & Combines
- » No subsidy for private sectors

# Subsidy System





### Injuries and Fatalities

- » Small and Not reported
- » Settled between related parties
- » No statistics on medical costs related to farm accidents

### Machinery Damage

- » Usually through tractor bogged down
- » Time loss is substantial
- » One incident took 12 days to recover machine and cost the owner USD 4,000

# Social Costs



# Combine harvester Test Rig



- » Mardi adopts ASABE and PAMI test procedures for combine
- » Adjustment made to ensure easy evaluation in the fields
- » Standard field instrumentations, tools, sampling procedures, processing & analysis of data used
- » Malaysia used this standard procedure developed by MARDI
  
- » **American Society of Agricultural and Biological Engineers (ASABE)**
- » **The Prairie Agricultural Machinery Institute – PAMI**

# Testing Procedure >

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# GRAIN LOSS MEASUREMENT



- » Only reconditioned combine in Malaysia, modified from imported scrap wheat harvester
  - » Major modifications : threshing & under carriage units
  - » Threshing elements changed from rasp to spike tooth type
  - » Sieve and straw walker replaced with locally made components
  - » Header is locally made
  - » Stainless steel used to increase strength
  - » MARDI is involved with reconditioning works

# SUMMARY



NO laws governing combine harvesters. National Legislations and Standardization of Combine harvesters required for:

1. Development of national standard criteria for combine harvesters
2. Establishment of national agricultural testing and evaluating center
3. Establishment of testing and evaluation code and procedures
4. Sales of certified machinery only, hence benefits the consumers
5. Strengthening the research in machinery testing locally
6. Improve quality and growth of local fabricated combine harvesters



## MARDI IS REQUESTING \$\$ FROM GOVT TO FUND THE FOLLOWING ACTIVITIES

1. Establishment of national legislation
2. Development of national standard criteria for combine harvester
3. Development of national Machinery Testing and Evaluation Code for combine harvester
4. Development of national testing and evaluating center for agricultural machinery
5. Developing manpower capable of testing and evaluating the machinery in the laboratory
6. Developing manpower capable of testing and evaluating the machinery in the field



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THANK YOU

