

SEACAP 020

By ITT
in association with
KCEC of Cambodia
&
ITST of Vietnam

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Enhancing the use of locally made, low
cost equipment for the road sector



Project Area

- Cambodia
- Vietnam
- Laos



The Team

- ITT, UK
- KCEC, Cambodia)
- ISTS, Vietnam
- A Freelance Consultant from Laos



Modules

- Towed Grader module
- Mobile Stone Crusher module
- Survey module



Towed Grader Module Objectives

- Is the Towed Grader a viable alternative to the Motor Grader?
- If so, in what circumstances?



Graders

- An engineering machine used in road construction to set a smooth surface and create the correct shape and camber for a road.
- Commonly used in the maintenance of unsealed road surfaces.
- Can be motorised or towed



Motor Grader

- Engine and driver's cab situated above two axles at the rear, a third axle at the front and a large blade in between.
- Capital Intensive
- Cost of new: \$100,000
- Cost (imported) second hand: \$15,000
- Hire cost roughly \$3000



Motor Grader (2)

- High maintenance cost
- Only needs one operator
- Needs good trained mechanics
- Needs high availability of spare parts
- High capacity (but only if utilised)
- No supporting machinery required (stand alone piece of equipment)



Modern Motor Grader



Towed Grader

- Predecessor of the motor grader
- No motor
- Tractor towed (therefore not standalone equipment)
- Little capital required (cost new is \$8,000)
- Second hand tractor is around \$10,000
- However, tractor has multiple uses



Towed Grader (2)

- Low maintenance costs
- Requires two operators
- Can be fabricated locally
- Mechanics can be trained to level required with relative ease
- Low capacity, but at certain utilisation rates can be more economical than the motor grader



Cam Grader



Simba



Interim Findings

- Towed graders in general only viable where a large unsealed road surface exists
- Daily costs for running the towed grader can be as low as 35 to 55% of running a motor grader
- Overall economic viability depends on the relative output rates, and research on this is still ongoing



Interim Recommendations for Towed grader: Cambodia

- Pilot project is recommended if output rates for towed graders prove high
 - Although most contractors prefer motor grader, there are potential applications for unsealed roads.
 - High percentage of unsealed roads
 - In need of maintenance



Interim Recommendations for Towed grader: Vietnam

- Towed grader is not recommended
 - Economic plan to pave 70% of basic access roads by 2010 – although seems unrealistic
 - But indicates that the market for towed grader is decreasing
 - There is already a much higher percentage of existing sealed surfaces compared to the other project countries



Interim Recommendations for Towed grader: Laos

- Towed grader recommended if output rates for towed graders prove high
 - Contractors and government officials seem open to the idea and there appears to be adequate demand.
 - Percentage of unsealed roads is high
 - Predicament unlikely to change



Stone Crusher Module Objectives

- Is the stone crusher a viable alternative to buying crushed aggregate from commercial quarry?
- If so, in what circumstances should this be applied?



Mobile Stone Crusher

- Alternative to breaking rocks by hand
- Alternative to large industrial style quarry based crushers
- Can crush rock on of diametres between 20 – 50 cm (depending on model)
- Can crush rock in any location, provided a trailer is available for transportation



Mobile Stone Crusher (2)

- Crushed stone can improve gravel road qualities
- Can be used to provide crushed rock for sealed road construction
- Can be used to provide rock for concrete in the construction industry
- Can be used to recycle construction rubble



Mobile Crusher



Interim Recommendations for mobile crusher

- Stone crusher can be economically viable, this is dependent on the contractors distance from a quarry source
- The break even distance – still being calculated
- A pilot project might help in any of the countries



Survey Module

- To provide an indication of acceptability among small scale contractors
- Interviewee – contractors & policy makers in three countries
- Data is being analysed
- Results are likely to be available by early-Oct., 2007



Thank You

