RRST VIETNAM
SEACAP 1
FINAL REPORT

Volume 3

APPENDIX N

SEACAP Dissemination Workshop
December 2006
Ministry of Transport, Vietnam

RURAL ROAD SURFACING RESEARCH

SEACAP 1 TRIALS DISSEMINATION WORKSHOP

Melia Hotel Hanoi, 6 December 2006

PROGRAMME

<table>
<thead>
<tr>
<th>Time</th>
<th>Item</th>
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<tr>
<td>08.00</td>
<td>Registration</td>
<td>(at Ballroom Foyer)</td>
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<tr>
<td>08.30</td>
<td>Official Opening</td>
<td>Dr. Nhan, Director of DST - MOT</td>
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SESSION 1: Research Background and Overall Aims

<table>
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<tr>
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<tr>
<td>08.40</td>
<td>RRSR relating to Transport Sector support</td>
<td>Dr S Lucas World Bank-DFID</td>
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<tr>
<td>08.50</td>
<td>RRSR relating to MoT goals</td>
<td>Dr Nhan RRST Committee</td>
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<tr>
<td>09.00</td>
<td>SEACAP initiative &amp; workshop objectives</td>
<td>David Salter, SEACAP</td>
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<tr>
<td>09.10</td>
<td>SEACAP 1 &amp; 4 – RRST background and rationale</td>
<td>Robert Petts, Intech-TRL</td>
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09.30

Refreshments

SESSION 2: The Research Work Undertaken

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<tr>
<td>09.50</td>
<td>RRST Framework, Preparations &amp; Design</td>
<td>Dr J R Cook, Intech-TRL</td>
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<tr>
<td>10.10</td>
<td>Construction Implementation</td>
<td>Pham Gia Tuan, IntechTRL</td>
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<tr>
<td>10.20</td>
<td>Construction Supervision</td>
<td>Representative ITST</td>
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<td>Contract Management experience</td>
<td>PMU18 Representative</td>
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<td>10.40</td>
<td>Contractor’s experience</td>
<td>Phuong Mai company, Hung Yen</td>
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<td>10.50</td>
<td>Summary of Surfacing Options Trialled</td>
<td>Bach The Dzung, Intech-TRL</td>
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<td>11.10</td>
<td>Discussion</td>
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1130

Lunch
## SESSION 3: KEY OUTCOMES

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<tr>
<td>13.00</td>
<td>Technical Recommendations</td>
<td>Dr J R Cook, Intech-TRL</td>
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<td>13.25</td>
<td>Cost Norms &amp; Cost Model</td>
<td>Pham Gia Tuan, Intech-TRL</td>
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<tr>
<td>13.40</td>
<td>Community Perspective</td>
<td>Truong Yen CPC, Ninh Binh</td>
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<td>13.50</td>
<td>Outputs, Future work &amp; Outstanding Issues</td>
<td>Robert Petts, Intech-TRL</td>
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<td>14.10</td>
<td>Discussions</td>
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14.30 Refreshments

## Session 4: FOLLOW UP RESEARCH & DISSEMINATION

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<th>Time</th>
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<tr>
<td>15.00</td>
<td>Provincial Perspective</td>
<td>Tien Giang PDOT</td>
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<td>15.10</td>
<td>MoT Perspective</td>
<td>Dr Nhan RRST Committee</td>
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<tr>
<td>15.20</td>
<td>International knowledge Sharing</td>
<td>Ranjith de Silva, IFRTD</td>
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<td>15.30</td>
<td>SEACAP Dissemination: SPM Report</td>
<td>Heng Kackada, CNCTP</td>
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<tr>
<td>15.40</td>
<td>Discussion</td>
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<tr>
<td>16.00</td>
<td>Dissemination &amp; Summary comments</td>
<td>David Salter, SEACAP</td>
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<td>16.10</td>
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<td>Dr Nhan RRST Committee</td>
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<td>16.20</td>
<td>Arrangements for Trial Sites Study Tour (7 Dec)</td>
<td>Bach The Dzung, Intech-TRL</td>
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16.30 Official Closing
### SEACAP 1 STUDY TOUR:
7 DECEMBER 2006
SITE VISIT PROGRAMME

For invited delegates

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<thead>
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<th>Location</th>
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<td>Depart Hanoi</td>
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<tr>
<td>Phuong Chieu RT2 road (Hung Yen province)</td>
<td>8.35'  8.55'</td>
<td>Stay on site: 20' (Option: Quarry-run)</td>
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<td>Tan Hung road (Hung Yen province)</td>
<td>9.05'  9.25'</td>
<td>Stay on site: 20' (Option: 15 cm Bamboo reinforced concrete/ 5cm sand/ 15cm cement stabilised sand)</td>
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<td>Yen Trach trial road (Ninh Binh province)</td>
<td>11.15' 11.35'</td>
<td>Stay on site: 20' (Option: 10cm Cobble-stone with sandy gravel matrix/ 5cm sand/ 24 cm WBM)</td>
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<td>Stone quarry (Ninh Binh province)</td>
<td>11.45' 12.05'</td>
<td>Stay on site: 20'</td>
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<td>Hai Ninh restaurant (Ninh Binh town)</td>
<td>12.25' 13.55'</td>
<td>Lunch: 1h30'</td>
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<td>Thu Trung trial road (Ninh Binh province)</td>
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<td>Stone Church</td>
<td>15.05' 15.50'</td>
<td>Cultural Visit: 45'</td>
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<td>Ha Noi arrival</td>
<td>19.05'</td>
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## LIST OF PARTICIPANTS

### SEACAP1 DISSEMINATION WORKSHOP - HANOI, 06 DECEMBER 2006

<table>
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<tr>
<th>No.</th>
<th>Delegates</th>
<th>Title/Position</th>
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<tr>
<td>1</td>
<td>HE Sous Kong MRD</td>
<td>Secretary of State</td>
<td>Ministry of Rural Development</td>
</tr>
<tr>
<td>2</td>
<td>H.E. Lim Sidenine</td>
<td>Under Secretary of States</td>
<td>Ministry of Public Work and Transport</td>
</tr>
<tr>
<td>3</td>
<td>Youn Sophal MRD</td>
<td>Advisor</td>
<td>Ministry of Rural Development</td>
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<tr>
<td>4</td>
<td>Ly Savuth</td>
<td>Deputy Director General</td>
<td>MRD</td>
</tr>
<tr>
<td>5</td>
<td>Prof. Prak Min EIC</td>
<td>President</td>
<td>Engineering Institute of Cambodia</td>
</tr>
<tr>
<td>6</td>
<td>HE Try Meng MRD</td>
<td>Under Secretary of States</td>
<td>Ministry of Rural Development</td>
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<tr>
<td>7</td>
<td>Prof. Chhouk Chhay Horng</td>
<td>Director - Civil Engineering Department</td>
<td>Institute of Technology of Cambodia, Ministry of Education</td>
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<tr>
<td>8</td>
<td>Ngoun Dara</td>
<td>Official</td>
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<tr>
<td>9</td>
<td>Luy Narin</td>
<td>Provincial Project Manager</td>
<td>KIW/TRIP 4</td>
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<td>10</td>
<td>Julian Abrahms</td>
<td>Advisor</td>
<td>UNDP/SEILA</td>
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<td>Heng Kackada</td>
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<td>Kace</td>
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<td>12</td>
<td>Sengdarith Kattignasack</td>
<td>Director, LRD</td>
<td>Ministry of Communication, Transport, Construction and Post</td>
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<td>13</td>
<td>Vanthong Boutanavong</td>
<td>Dept. PD for NR No.3 improvement Project</td>
<td>Ministry of Communication, Transport, Construction and Post</td>
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<tr>
<td>14</td>
<td>Oudone Phitsalath</td>
<td>Engineer DCTPC Borkeo Province</td>
<td>Ministry of Communication, Transport, Construction and Post</td>
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<tr>
<td>15</td>
<td>Vandy Vorosak</td>
<td>Resident Engineer, SEACAP 17</td>
<td>Lao Transport Engineering Consultants</td>
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<tr>
<td>16</td>
<td>Belal Hussain</td>
<td>Team Leader</td>
<td>HiFAB</td>
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<td>17</td>
<td>Sikuradipathi Ganithayalage Chandradasa</td>
<td>Manager WB Rural Roads Project</td>
<td>Ministry of Provincial Councils and Local Government</td>
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<td>18</td>
<td>Illayapparachchi Eric Wellington Fernando</td>
<td>Secretary of State for Development</td>
<td>Ministry of Provincial Councils and Local Government</td>
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<td>19</td>
<td>Jayalath Granie Rufus</td>
<td>Engineer</td>
<td>Road Development Authority, Ministry of Highways</td>
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<td>20</td>
<td>Fergus Gleeson</td>
<td>Rural Road Program Manager</td>
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<td>21</td>
<td>Ranjith de Silva</td>
<td>Coordinator - AP</td>
<td>IFRTD</td>
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<td>22</td>
<td>Pannillage Upali</td>
<td>Rural Roads Program Manager</td>
<td>Practical Action</td>
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<tr>
<td>23</td>
<td>Ahsan Tayyab</td>
<td>Sr. Resource Management Specialist</td>
<td>ADB Manila - Philippines</td>
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<tr>
<td>24</td>
<td>Paul Valenty</td>
<td>Transport Advisor</td>
<td>ADB Viet Nam</td>
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<td>25</td>
<td>Jeff Miller</td>
<td>Principal Transport Specialist</td>
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<td>David Salter</td>
<td>SEACAP Manager</td>
<td>UNOPS - Cambodia</td>
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<td>27</td>
<td>Chris Dongess</td>
<td>Manager</td>
<td>ILO ASIST Bangkok</td>
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<td>28</td>
<td>Kate Czuczman</td>
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<td>Chris Forwell</td>
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<td>Mark Watson</td>
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<td>Peter O'Neil</td>
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<td>Nguyễn Trọng Phú</td>
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<td>Dept. of Science and Technology - MoT</td>
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<td>Dept. of International Cooperation - MoT</td>
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<td>Đầm Quang Tuán</td>
<td>Director - Center of Rural Planning and Development</td>
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<td>Lại Xuân Cường</td>
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<td>Nguyễn Thiệu Mai</td>
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<td>Ministry of N/Resources and Environment</td>
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<td>Dr. Nguyễn Văn Nhân</td>
<td>Director of DST-MoT, S.C Chairman</td>
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<tr>
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<td>Mr. Hoàng Công Quỹ</td>
<td>RTU Chief</td>
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<td>Mr. Trần Tiến Sơn</td>
<td>Steering Committee Secretary</td>
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<td>Dr. Đoàn Thị Phín</td>
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<td>Mr. William Paterson</td>
<td>Lead infrastructure specialist</td>
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<td>47</td>
<td>Dr. Simon Lucas</td>
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<td>Nguyễn Kim Ngân</td>
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<td>Director</td>
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<td>Đỗ Thanh Lâm</td>
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<td>Vũ Phú Cường</td>
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<td>Ninh Bình PDOT</td>
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<td>Lê Quang Xoa</td>
<td>PPMU Vice Director</td>
<td>Ninh Bình PDOT</td>
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<td>Nguyễn Trung Thành</td>
<td>Chairman of Trường Yên CPC</td>
<td>Trường Yên Commune - Ninh Bình</td>
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<td>Nguyễn Trọng Hạ</td>
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<td>Phạm Công Tiến</td>
<td>Contractor</td>
<td>Hưng Yên Province</td>
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<td>Phan Văn Trung</td>
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<td>Chief of Int'l Cooperation's Dept.</td>
<td>ITST</td>
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<td>92</td>
<td>Mr. Ta Văn Giang</td>
<td>Deputy Chief - Int'l Cooperation Dept</td>
<td>ITST</td>
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<tr>
<td>93</td>
<td>Mr. Ung Việt Trung</td>
<td>Director - TDICC</td>
<td>ITST</td>
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<td>94</td>
<td>Mr. Nguyễn Đình Khoa</td>
<td>Specialist</td>
<td>ITST</td>
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<td>Robert Petts</td>
<td>Regional Manager</td>
<td>Intech-TRL</td>
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<td>Dr. Jasper Cook</td>
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<td>Phạm Gia Tuấn</td>
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<td>Lê Đức Thọ</td>
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<td>Nguyễn Quỳnh Lan</td>
<td>Office Manager</td>
<td>Intech-TRL</td>
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</tbody>
</table>
LIST OF POWERPOINT PRESENTATIONS

1. RRSR relating to Transport Sector support - Dr S Lucas World Bank-DFID
2. SEACAP 1 & 4 – RRST background and rationale - Robert Petts, Intech-TRL
3. RRST Framework, Preparations & Design - Dr J R Cook, Intech-TRL
4. Construction Implementation - Pham Gia Tuan, Intech-TRL
5. Construction Supervision - Representative ITST
6. Summary of Surfacing Options Trialled - Bach The Dzung, Intech-TRL
7. Technical Recommendations - Dr J R Cook, Intech-TRL
8. Cost Norms & Cost Model - Pham Gia Tuan, Intech-TRL
10. International knowledge Sharing - Ranjith de Silva, IFRTD
11. SEACAP Dissemination: SPM Report - Heng Kackada, CNCTP
The role of Surface Trials in developing rural transport in Vietnam

Simon Lucas
Infrastructure Specialist
World Bank
Rural Road Surfacing Research Workshop
6th December 2006 Hanoi

Today’s agenda
- Importance of rural roads
- Three problems for rural roads in Vietnam
- Why are road standards important?
- What can donors do better?
- Conclusion

Importance of rural transport

Vietnam - better rural access than most comparable countries

Clear links between improved access and poverty reduction

Today’s agenda
- Importance of rural roads
- Three problems for rural roads in Vietnam
- Why are road standards important?
- What can donors do better?
- Conclusion

Problem 1 – Reaching the last 5%

- 290 communes left unconnected – RTSS 2005
- Most remote and costly – 4-6 times per person
- Need cost effective solutions to enable poor provinces to provide access
- The more remote the more they must rely on local materials and labor based techniques
- Using the most appropriate specifications critical

Problem 2 – Coping with growth

- Traffic in richer areas, more, heavier, faster – RTSS 2005
- Need higher standards and better surfaces
- Need cost effective solutions to minimize whole life costs
- Need a range of options tailored the local environment and conditions
- Using the most appropriate specifications critical
Problem 3 – Sustaining Access

- 290 communes still!
- Maintenance under funded - poor paying most RTSS 2005
- Need appropriate options that are maintainable
- Need options that can be maintained at the local level
- Not a substitute for planned maintenance but….
- Using the most appropriate specifications critical

Today's agenda

- Importance of rural roads
- Three problems for rural roads in Vietnam
- Why are road standards important?
- What can donors do better?
- Conclusion

Why are road standards important?

- Invested VnD 29,241 ($1.8bn) 2000-04
- Substantial Increase for next 15 years
- Key component of new SEDP to ensure the rural areas are not left behind in Vietnam’s rapid economic growth
- But transport needs more complex and costly

Todays agenda

- Importance of rural roads
- Three problems for rural roads in Vietnam
- Why are road standards important?
- What can donors do better?
- Conclusion

Why are road standards important?

- Efficiency of investment not maximized
- Some roads over invested – some under
- Critically all under-maintained
- Need scientific basis for decision making
- Using the most appropriate specifications critical
What can donors do better?

• Support Provinces to make better choices
• Provide resources to fund decisions
• Support improved monitoring and share experience
• Help develop maintenance systems and fund them
• Using the most appropriate specifications critical

Today's agenda

• Importance of rural roads
• Three problems for rural roads in Vietnam
• Why are road standards important?
• What can donors do better?
• Conclusion

Conclusion

• Trials producing real evidence of whole-life cost
• Need to share information on what works where
• Need to be adopted as MoT standards
• Need to be linked to MoT Rural Transport strategy
• Need to ensure that they are used to maximize investment efficiency
• Surface options need to be linked to maintenance guidelines & funding – Inter-ministerial circular
• Using the most appropriate specifications critical

The role of Surface Trials in developing rural transport in Vietnam

Thank You

Simon Lucas
Infrastructure Specialist
World Bank
Rural Road Surfacing Research Workshop, 6th December 2006 Hanoi
Rural Road Surfacing Research (RRSR) SEACAP 1 Trials Dissemination Workshop

RRSR : SEACAP 1 Background and Rationale

by
Robert Petts, BSc CEng MICE MIHT MIAgrE, IntechTRL

Background
- There has been an unsustainable reliance on gravel roads to solve the access problems of poor and rural communities in Vietnam.
- Justification of gravel surfaced roads has been based on research carried out in other regions.
- Vietnam is a particularly challenging environment for unpaved roads.

Page 2

Development requires good ACCESS

Rural Economic and Social development needs commercial, educational, health and infrastructure initiatives that rely on GOOD PERMANENT ACCESS.
Unfortunately, Poor Access for many rural communities limits the effectiveness of these initiatives, because of:
- unreliable travel or impassability, especially in the rains,
- high unit transport costs for goods, services & people.

Investment is discouraged by poor access.

Page 3

Need for Rural Road Surfacing Research

- Concern of MoTr regarding sustainability of RT1 and RT2 gravel roads
- Some provinces “sealed” their project gravel roads
- Evidence from recent DFID KaR research and experiences elsewhere in the region
- Proper gravel road maintenance is difficult to achieve
- Existing options and guidelines for alternatives were limited

- Need for research into gravel performance in Vietnam and to develop a ‘menu’ of more durable, low cost, low maintenance, local-resource-based surfaces, using gravel only where appropriate.

Page 4

Gravel – The Traditional ‘Rule of Thumb’

Surface Choice based on Whole Life Costs

Now Discredited

Figure 1 - Poverty & Accessibility, Vietnam 2002

Poverty is linked to Poor Access

Figure 1

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% 110%
0% 20% 40% 60% 80% 100% 120%

Accessibility (population within 2km of all-weather road) Excluding Mekong Delta Provinces

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% 110%

Poverty Rate

Now Discredited

Appendix N - January 2007
Rural Road Surfacing Research (RRSR)

Project Objective:
National specifications and guidelines to be developed for a complete ‘menu’ of surface options suitable for the range of Vietnam conditions.

- Research to be implemented under RT2 framework
- MoT, DFID and World Bank as stakeholders
- Establishment of an MoT Steering Committee, chaired by Department of Science & Technology
- Rural Road Surfacing Trials initially in 2 Regions of Vietnam RRST-I (4 provinces in Mekong + Central Coastal)
- Investigations of RT1 and RT2 gravel (un-paved) roads performance (RRGAP – SEACAP 4)
- RRST-II extended to “roll out” trials in 3 further Regions (8 provinces in Northern Highlands, Central Highlands and Red River Delta).

Study identified need
- RRST-I = 4 provinces
- RRST-II = 8 provinces
- National “Roll out” US$600,000 of World Bank funds

Initial investigations in 2001
- RT1 & RT2 Roads, 2005
- World Bank: US$3.8 million

- Gia Lai, Dak Lak, Dak Nong, Ninh Binh, Hung Yen, Ha Tinh, Quang Binh, Tuyen Quang Provinces, 2006
- Planned application: US$100+ million RT3 from 2007, and other programmes

Where are we now?
- Identify need
- Construction research/compile knowledge
- Initial Recommendations
- Long Term Monitoring
- Disseminate

Specifications, Norms & Standards
- Road Authority practice
- Academic Institutions
- Training-Mentoring
- Practicing Engineers
- Donor Programmes
- Contractor enabling environment
- International forums
Rural Road Surfacing Research
SEACAP 1
Trials Dissemination Workshop

Framework, Preparation and Design

Dr J R Cook
Intech-TRL

OVERALL RESEARCH OBJECTIVE
SUSTAINABLE RURAL ROADS

Available Materials

Road Environment
Road Task

Short lengths of relevant pavement options on single selected roads in 4 provinces 2 regions:
Mekong Delta
Central Coast

Longer length construction trials in 37 roads in 8 provinces in 3 regions:
Red River Delta
Central Highlands
Northern Highlands

Trials Framework- Key Elements

Co-ordination and strategic guidance by a Ministry of Transport Steering Committee, Chaired by Dr Nguyen Van Nhan

Technical assistance work by Intech-TRL in conjunction with the Institute of Transport Science and Technology (ITST).

Construction budget through the World Bank RT2 programme, with contract management by PMU18

Trial Preparation-Key Elements

Discussion with Provincial authorities and stakeholders as to selection of trial roads and trial procedures

Assessment of general trial road characteristics and governing environment

Identification of suitable trial options acceptable to local stakeholders – leading to trial designs

Preparation of specifications, cost-norms and Bills of Quantity and liaison with RT2 Project Managers (PMU18)
Road Environment Factors are considered a key issue in the sustainability of low volume rural roads

- Climate
- Hydrology
- Terrain
- Sub-Grade Conditions
- Construction Materials
- Traffic
- Axle Loads
- Construction Regime
- Maintenance Regime

Rainfall 2003

<table>
<thead>
<tr>
<th>Province</th>
<th>Region</th>
<th>Average Rainfall (mm)</th>
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</thead>
<tbody>
<tr>
<td>Hue</td>
<td>Mekong</td>
<td>1489</td>
</tr>
<tr>
<td>Da Nang</td>
<td>Mekong</td>
<td>1446</td>
</tr>
<tr>
<td>Pleiku</td>
<td>C. Highlands</td>
<td>2101</td>
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</table>

Terrain

<table>
<thead>
<tr>
<th>Region</th>
<th>Key Character</th>
<th>Likely Sub-Grade Strength</th>
<th>No. of Trial Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deltaic</td>
<td>Low-lying, floods, silt, clay</td>
<td>Very Low</td>
<td>18</td>
</tr>
<tr>
<td>Coastal</td>
<td>Low-lying, sandy</td>
<td>Low-Moderate</td>
<td>3</td>
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<tr>
<td>Lowland</td>
<td>Irrigated agriculture; embankments</td>
<td>Low</td>
<td>8</td>
</tr>
<tr>
<td>Upland</td>
<td>Hilly</td>
<td>Moderate erosion</td>
<td>Moderate</td>
</tr>
<tr>
<td>Mountainous</td>
<td></td>
<td>Steep slopes, high erosion</td>
<td>High</td>
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</table>

Traffic

<table>
<thead>
<tr>
<th>Region</th>
<th>Province</th>
<th>Road</th>
<th>ADT (24 Hrs)</th>
<th>% 4 wheel Motorised</th>
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<tbody>
<tr>
<td>Mekong</td>
<td>Tien Giang</td>
<td>Tan Thuan Tay</td>
<td>155</td>
<td>0</td>
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<tr>
<td></td>
<td>Dong Thap</td>
<td>My Phuoc Tay</td>
<td>242</td>
<td>0</td>
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<tr>
<td>C Coastal</td>
<td>Da Nang</td>
<td>Thong Nhat</td>
<td>142</td>
<td>1</td>
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<tr>
<td></td>
<td>Gia Lai</td>
<td>la Prol</td>
<td>324</td>
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<td></td>
<td>Dak Nong</td>
<td>Kien Duc</td>
<td>547</td>
<td>6</td>
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<td>C Highlands</td>
<td>Dak Lak</td>
<td>Cu Nga</td>
<td>406</td>
<td>12</td>
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<tr>
<td></td>
<td>Hung Yen</td>
<td>Nhat Quan</td>
<td>235</td>
<td>22</td>
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<tr>
<td></td>
<td>Ninh Binh</td>
<td>Yen Tu</td>
<td>168</td>
<td>5</td>
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<tr>
<td>Red River</td>
<td>Tuyen Quang</td>
<td>Lang Quan</td>
<td>400</td>
<td>5</td>
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<td>Cam Lien</td>
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<td>N Highlands</td>
<td>Ha Tinh</td>
<td>Thach Minh</td>
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Local Materials

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<tr>
<th>Region</th>
<th>Province</th>
<th>Crushed Rock</th>
<th>Stone Blocks</th>
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<tr>
<td>C Coastal</td>
<td>Ga Nang</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
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<td>Gia Lai</td>
<td></td>
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<td></td>
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<tr>
<td>C Highlands</td>
<td>Dak Nong</td>
<td></td>
<td></td>
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<td>Dak Lak</td>
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<td>Red River</td>
<td>Hung Yen</td>
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<td>Ha Tinh</td>
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</table>
Unsealed Gravel Studies

Parallel studies on the behaviour of existing unsealed rural roads (SEACAP 4) had highlighted a serious mis-match between the design options currently used; the road environment; road tasks; and construction materials.

270 unsealed road sections constructed in the period 1998-2004 were examined. Nearly 60% showed material loss above a sustainable 20mm/year.

RRST-I Methodology

Based on the design, construction and monitoring of short lengths of a range of new options and control sections constructed under tight supervision and control conditions.

RRST-II Methodology

- Longer lengths of trial and control options – normal contract conditions,
- Using more standard supervision procedures under a specialist QA regime
- Using a knowledge-based selection process for selecting trial designs,
- Wider involvement of local consultants than RRST-I
- Increased dissemination local levels

Trial Initiation Processes

- Stakeholder discussions
- Selection of candidate roads
- Selection of options for trial
- Preliminary design of trial layout
- Site characterisation
- Design of trial pavements
- Costing of trial pavements

General Design Sequence
**Site Characterisation**

- Traffic surveys
- Assessment of sub-grade conditions,
- Assessment of governing physical environment in terms of terrain, flood potential and rainfall,
- Assessment of construction materials, including their suitability for stabilisation by lime, cement or bitumen emulsion.

**Trial Option Selection**

Apart from site characterisation trial option selection was based on a number of key strategic issues

- Reduced maintenance burden,
- Low expected whole-life-costs,
- Improved sustainability,
- Load spreading properties
- Durability in the expected traffic & environmental conditions,
- Use of locally available or produced materials.
- Techniques with low capital investment, & manageable by local contractors,
- Use of local labour and skills,
- Socially and environmentally acceptable use of materials

**Stabilisation Testing**

- Lime % Vs CBR Strength
- Cement % Vs UCS Strength

**Trial Layouts**

**RRST-I**
- A. Training Sections 100m
- B. Trial Sections 175-200m
- C. Control Sections 100m
- D. Non-Trial Sections

**RRST-II**
- A. Trial sections 300-2000m
- B. Control sections 100-2500m

Monitoring Sections: all type B and C

**Detailed Option Designs**

1. Strengths of existing pavements & sub-grade,
2. Laboratory test results on construction materials,
3. Traffic patterns, based on 3-day or 7 day surveys,
4. Existing MoT strength requirements for rural roads
5. Existing MoT designs for rural roads (6T axle limit),
6. Cross-check with ARRB and recent TRL research on rural road pavement strengths,
7. Local designs supplied by the PDoTs,
A wide range of rural road pavement options have been constructed in a representative selection of Vietnamese road environments.

**General Design Cross-Check**

### Equivalent ARRB Design Chart 10.4

<table>
<thead>
<tr>
<th>Sub-Grade CBR=3 Traffic: 50,000 esa</th>
<th>Sub-Grade CBR=7 Traffic: 50,000 esa</th>
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<tbody>
<tr>
<td>Soaked Dong Thap: Tan Thuan Tay Road Ha: Phu Loc Road (Part)</td>
<td>Soaked Tan Giang: My Phuoc Tay Road Ha: Phu Loc Road (Part)</td>
</tr>
<tr>
<td>CBR= 3</td>
<td>CBR= 7</td>
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<tr>
<td>65</td>
<td>65</td>
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<td>30</td>
<td>30</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
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</table>

**Trial Options**

- **H6**
- **H7 (H11-N)**
- **H8**
- **H9**
- **H10**

**Cross sections**

- **Clay brick over cement stabilised sandy soil**
- **Bamboo reinforced concrete over lime stabilised soil**

**Programmes**

**Summary**

1. Construct Trial & Control sections under QA supervision
2. Assess specifications and construction procedures and note potential technical difficulties
3. Collect data on as-built trial condition and immediate post construction condition (12 months)
4. Use information from 2+3 for assessing option suitability and finalising specifications and norms
Summary

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<th>Description</th>
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<td>Assess trial option construction issues under full-scale conditions</td>
<td>✔️</td>
</tr>
<tr>
<td>6</td>
<td>Collect construction cost data and procedure information</td>
<td>✔️</td>
</tr>
<tr>
<td>7</td>
<td>Monitor Trial and Control section performance and associated maintenance costs over a number of years</td>
<td>?</td>
</tr>
<tr>
<td>8</td>
<td>Use information from 6+7 for Whole Life Cost assessment</td>
<td>?</td>
</tr>
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</table>
Rural Road Surfacing Research
SEACAP 1
Trial dissemination workshop

RRST-I Implementation procedure

Prepared by: Pham Gia Tuan
Th, ng 12, 2006

Intech Associates

Overview

- RRST-I background
- The advisory role of Intech-TRL
- The difficulties during the implementation
- Lessons to success
- Conclusions and recommendations

The RRST-I Background

- RRST-I program was initiated at 4 provinces of the regions of Mekong river delta (Tien Giang, Dong Thap) and Central coastal (TT Hue, Da Nang) with the total allocated trial construction budget of 600,000USD.
- RRST Steering Committee was established including representatives from Departments of DST and DPI, and research institutions of ITST and TDSI under MoT and the donors of WB & DFID.
- Intech-TRL was selected to be the technical advisor for the RRST-I program.

The RRST-I Background

- Other stakeholders that were providing with efficient support for RRST-I great success included the project PDoTs/PPMUs, PMU18, local consultants and contractors etc.

The Advisory Role of Intech-TRL

- Select and design the RRST-I trial pavement options.
- Prepare draft specifications for the RRST-I trial pavement options.
- Prepare draft cost norms and cost estimation for the RRST-I trial pavement options.

The Advisory Role of Intech-TRL

- Select, survey and make arrangements of trial roads.
- Conduct training and provide technical support to the local consultants and contractors.
- Report and solve any unexpected technical issue.

Appendix N - January 2007
Difficulties during the implementation process

- Some difficulties in preparation and applying for approval for temporary use of some new cost norms.
- Some potential problems since trial works was implemented in the regions with different road environments and conditions such as weather, materials and equipment etc.
- The contractors were not experienced in building some new trial options so that they faced with some difficulties at the start of construction phase.

The lessons to success

The RRST-I program came to the today success thanks to:

- Efficient attention and instruction from the RRST Steering Committee.
- Efficient cooperation amongst the related stakeholders including Intech-TRL as the key technical coordinator.
- Efficient support and cooperation from the local authorities at provincial level to commune level as well as the great contribution from the contractors and local communities.

Conclusions & Recommendations

- RRST-I program was completed successfully and can be seen as the key for the larger scale RRST-II program. The RRST-II program shall be discussed later by our local partner, ITST.
- Currently, short term monitoring and maintenance are being conducted for initial assessment of trial options.
- Long term monitoring should be continued at least in the next 5 years to define the whole life cost of each trial pavement option.

Thank you!
Quality Assurance Partnership

- Contractors
- PDoT/PPMU
- Data Collection Consultants - ITST
- Quality Assurance Consultants (Intech-TRL)

Presentation Contents
- Quality Assurance Partnership
- Construction Supervision Components - Facts & Recommendations
- Conclusion

The Contractor

Construction of road lengths to RRST – II (modified RT2) specifications
Keeping of construction daily progress records
Liaison with PPMU and ITST on progress and any problems

PPMU-1

Ensuring individual trials contract compliance
Standard RT2 responsibilities for contract administration with PDoT
Liaison with ITST on contract control testing, data, and progress
Liaison with Intech-TRL on trial pavement engineering problems

PPMU-2

Responsible for solution of non-trial design and construction queries;
- Earthworks
- Drainage
- Structures

Data Collection Consultants (ITST)-1

Responsible for ensuring construction materials, plant and procedure compliance for trials pavements
Instruct and Co-operate with local supervisors on individual contract supervision in compliance with the Technical Guidelines
Collection of trials data either directly or in liaison with contractors and PPMUs as required by the Intech-TRL and the RRST Steering Committee
Data Collection Consultants (ITST) - 2

- Reporting of progress and any technical problems to Intech-TRL and the RRST Steering Committee
- Liaison with Intech-TRL on the need for technical support and engineering advice on trials pavements
- Undertake post-construction as-built quality surveys for each road link & stakeholder surveys

Quality Control Consultants (Intech-TRL)

- Responsible for technical excellence of the trials by liaison with ITST and PPMUs
- Technical support to ITST and specialist advice to contractors on trials pavements
- Spot-check Quality Control on contract compliance
- Solution of technical problems and queries in conjunction with the RRST Steering Committee
- Signing off role on contract completion

Construction Supervision Components

- Technical Guidelines Compliance for the Designs of Trials Pavements
- Construction Materials
- Construction Plant
- Construction Procedures
- Design Compliance

Specification Compliance - The Design

- The Detailed Designs prepared by Local Provincial Consultants (LPC)
- A small but significant number of instances, the LPCs failed to follow the designs recommended by Intech-TRL, the Steering Committee and good practices. However, they were corrected on time during construction period.

Specification Compliance - The Design

Recommendation:

- Local Provincial Consultants (Design consultants) should be trained to make sure that the designs are to be done accordingly to the Technical Guidelines and rural road construction conditions

Construction Plant/Equipment-1

Many contractors have used heavy equipment rather than that as required by the specification. This still meets the project’s requirements to construct required quality rural roads. However, some objectives of the project can not be achieved as:

- Verification of the suitability of the Technical Guidelines’ requirements for equipment and construction procedures with specified equipment
- Data collection for development of norms for light equipment
Construction Plant/Equipment-2

Recommendations:
- Contractors should be encouraged to have appropriate equipment for rural road construction included in the bidding documents.
- Development of norms for light equipment should be carried out.

Construction Procedures-1

- Most of the trial specifications are based around the requirement to comply with a set of defined procedures, such as:
  - Surface preparation
  - Material placement or mixing
  - Moisture control
  - Compaction
  - Drainage
  - Layer finishing or protection

Construction Procedures-2

- Clear and simple guidelines defined by the Technical Guidelines. Contractors were easily to follow.
- For some complicate trial options, Contractors were well trained by Quality Assurance Consultants (Intech-TRL) before constructing, in terms of construction techniques and quality assurance.

Construction Procedures-3

- Sub-grade Preparation
- Concrete Placing
- Surface Dressing
- Surface Dressing

Construction Materials

- In most provinces, selected sources are capable of producing acceptable materials and the materials delivered to sites reasonably comply with the specification.

Laboratory and Site Testing-1

- Small local commercial laboratories are approved and used for RRST-II. Most of them can only perform some required testings for trials options in each province.
- Many laboratories are not familiar well with them testings required the use of AASHTO, ASTM or BS specifications.
- Delay in submission and approval process of materials in many cases did affect selection of material source and contract progress.
Laboratory and Site Testing-2

Recommendations:
- A list of qualified local laboratories which meet the requirements of the RRST should be made and recommended for future approval.
- Where applicable, Vietnam Standard Specification for Testing of Material should be used.

Design Compliance

- Some design compliance of road construction were recorded. However, tight supervision of DCC supervisors (ITST), prompt instruction of the QCC (Intech-TRL) and early correction of Contractors have been made.

Conclusion

- Contracts of the RRST-II were successfully constructed and tightly supervised by all parties
- The trial results can be applied in the next phases and/or projects

THANK YOU
I. GENERAL INTRODUCTION

- Previous reliance on gravel, stone macadam, pen-mac and slab concrete paving for rural roads in Viet Nam.
- Trial Objectives: to expand knowledge and experience of paving options known in Viet Nam and elsewhere.

II. DESCRIPTION OF OPTIONS TRIALLED

1. Options Trialled:
     - Emulsion seal is the trial option of all RRST provinces.
     - Emulsion seals are new to some contractors and that resulted in much time consumption for training.
   - After construction completion, contractors highly appreciated this option thanks to simple construction procedures, safety, no environmental pollution and rather short construction time etc.
   - This option then is suggested to PDOT for largely usage in the next rural road projects.
1. **Options Trialled** (Continue):

- **Load Bearing Surfaces:** Steel Reinforced Concrete, Bamboo Reinforced Concrete, Unreinforced Concrete, Concrete Brick, Clay Brick (Sand and Mortar Jointed), Dressed Stone, Cobble Stone.

1. **Options Trialled** (Continue):

- **Base/ sub-base:** Dry-Bound Macadam (DBM), Water-Bound Macadam (WBM), Cement Stabilized Soil, Lime Stabilized Soil, Emulsion Stabilized Soil, Graded Crushed Stone, Natural Gravel, Quarry-run.

1. **Options Trialled** (Continue):

- **Shoulders:** DBM, WBM, Cement Stabilized Soil, Lime Stabilized Soil, Natural Gravel, Quarry-run, Bitumen sealed DBM.

2. **Control Sections:**

- Hot Bitumen Chip Seal, Penetration Macadam, Natural Gravel, unsealed WBM.

3. **Training Sections:** same as trial options.

### Pavement Layer Options

- **Trial pavement options of RRST provinces**

<table>
<thead>
<tr>
<th>RRST Province</th>
<th>Measuring Mile</th>
<th>Central District</th>
<th>Rural District</th>
<th>Provincial Road</th>
</tr>
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<tbody>
<tr>
<td>Mekong Delta</td>
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<tr>
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<td>Northern Highlands</td>
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</table>

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Appendix N - January 2007
III. BRIEF ADVANTAGES AND DISVANTAGES

<table>
<thead>
<tr>
<th>Key Trial and Control Pavement layers</th>
<th>Emulsion Sand/Stone Chip Seals</th>
<th>Lime stabilised Base/Sub-base</th>
<th>Cement Stabilised Base/Sub-base</th>
<th>Emulsion Stabilised Sub-Base</th>
<th>Sealed Dry-Bound Macadam</th>
<th>Dressed Stone</th>
<th>Fired Clay Bricks</th>
<th>Concrete Bricks</th>
<th>Sealed Armoured Gravel</th>
<th>Steel Reinforced Concrete</th>
<th>Bamboo Reinforced Concrete</th>
<th>Unsealed Natural Gravel</th>
<th>Penetration Macadam</th>
<th>Unsealed Water-Bound Macadam</th>
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<tr>
<td><strong>Key Markers</strong></td>
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<td>Resistance to Rainfall/Flooding</td>
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<td>Load Spreading on Weak Sub-Grades</td>
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<td>Resistance to Axle Overloading</td>
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<td>Likely Whole Life Cost Advantages**</td>
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<td>User advantages (Low Roughness)</td>
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</table>

**Notes**
1. Positive advantage: +
2. No advantage/disadvantage: 0
3. Probable advantage: X
4. Definite disadvantage: -

* Assuming material locally available

** Anticipated "Best Performers".

IV. CONCLUSIONS

- New options for contractors: cement stabilised sand, dry bound macadam, emulsion seal, bamboo reinforced concrete etc. → Train on job.
- Through the RRST outputs, Provinces can find the most appropriate options suitable for use of local resources and for the range of natural conditions found in Viet Nam.

Thank you
Technical Recommendations

Differing approaches in the two RRST trial programmes in conjunction with the associated gravel studies (SEACAP 4) have allowed a wide range of technical recommendations to emerge from the RRSR; not only with respect to the options themselves but also on key issues such as contractor capability, technical supervision and quality assurance.

Key Technical Recommendations

- Assessments of a range of rural road options
- Appropriate use of construction materials
- Technical specifications
- Selection framework for pavement options
- Construction and quality control
- Appropriate low volume rural road standards

Bamboo Reinforced Concrete

**ADVANTAGES**
- Very heavy duty for traffic
- Suited to labour-based small contractor/community approach.
- Erosion resistant, durable, very low maintenance and easily repairable.
- Not constrained by gradient.
- High residual value on materials.
- Ideal for low strength subgrades

**DISADVANTAGES**
- High initial costs.
- Sensitive to cement costs

Bituminous Chip Seal

**ADVANTAGES**
- Widely used intermediate technology option.
- Good performance record if well constructed (real life up to 14 years).
- Can be used as a low cost maintenance treatment on some surfaces.

**DISADVANTAGES**
- Requires good construction control on road base preparation and on binder & aggregate spreading.
- Requires suitable supply of quality aggregate.
Local Materials

A key objective in sustainable rural road design is to best match the available material to the road task and the local environment.

The use of locally available, but possibly non-standard, pavement construction materials plays a significant role within this concept.

Appropriate Use of Gravel

Significant technical constraints have been recommended on the use of unsealed gravel pavements in terms of:
- Long hauls, high rainfall, high traffic, poor material, steep gradients, flooding, poor construction practices and lack of maintenance capacity.

These recommendations have been incorporated into a gravel use flow chart.

Appropriate Use of Gravel

The research has clearly indicated that there are appropriate uses for suitable quality laterite, colluvial and alluvial gravels:
- As an unsealed road surface or shoulder material in certain road environments
- As a base or sub-base material
- As a temporary road surface within a staged construction programme

Gravel has been trialled in the RRST programmes as a sub-base or base as well as being used as unsealed control sections.
Staged Construction

When the funds available immediately are limited, but more funding is reliably expected in the future, a ‘Stage Construction’ approach may be used. This involves providing a basic improvement of the surface initially, then providing further pavement layers later as resources permit.

Composite Construction (Spot Improvement)

Flexibility in Pavement Design

Modify the material to suit the pavement options

Modify the options to suit the materials available,

Appropriate Specifications

By necessity, general specifications must cover a very wide range of material types and environments. As a consequence they are likely to contain significant in-built factors-of-safety. However, proven specifications drawn-up for specific materials for particular environments need not be so conservative in approach.

Appropriate Specifications

Appropriate to the road function

Appropriate to available materials

Specifications must to be realistic and achievable – otherwise they are pointless

Gravel

Appendix N - January 2007
New Specifications

<table>
<thead>
<tr>
<th>Reference</th>
<th>Specification</th>
</tr>
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<tbody>
<tr>
<td>RRST 1-01</td>
<td>Bituminous Emulsion – Surface Dressing Chip seal</td>
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<tr>
<td>RRST 1-02</td>
<td>Bituminous Emulsion – Sand Seal</td>
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<td>Gravel Sub-Base/Base</td>
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<tr>
<td>RRST 2-03</td>
<td>Cement Stabilised Sub-Base/Base</td>
</tr>
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<td>RRST 2-04</td>
<td>Emulsion Stabilised Sub-Base/Base</td>
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<tr>
<td>RRST 2-05</td>
<td>Armoured Gravel Roadbase</td>
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<tr>
<td>RRST 2-06</td>
<td>Sand Sub-Base</td>
</tr>
<tr>
<td>RRST 2-07</td>
<td>Quarry-Run Sub-Base</td>
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<tr>
<td>RRST 2-08</td>
<td>Graded Crushed Stone Sub-Base/Base</td>
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<tr>
<td>RRST 2-09</td>
<td>Sand Bedding Layer</td>
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<tr>
<td>RRST 2-10</td>
<td>Dry Bound Macadam Sub-Base/Base</td>
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Seals

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<td>RRST 3-01</td>
<td>Fired Clay Brick Pavement – Unmortared Joints</td>
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<td>Fired Clay Brick Pavement – Mortared Joints</td>
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<td>Non-Reinforced Concrete</td>
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<td>Sealed Macadam Shoulders</td>
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Sub-Base - Base

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<tr>
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<th>Specification</th>
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<tr>
<td>RRST 1-01</td>
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<td>Armoured Gravel Roadbase</td>
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<td>RRST 2-06</td>
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<td>RRST 2-08</td>
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<td>Sand Bedding Layer</td>
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<tr>
<td>RRST 2-10</td>
<td>Dry Bound Macadam Sub-Base/Base</td>
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</tbody>
</table>

Block Paving

Concrete

Shoulders

Specification Guides

Each specification will be accompanied by a short technical guide illustrating and highlighting key aspects in the construction or supervising procedures.

Rural road Pavement Selection

The initial selection of pavement type should be on a whole range of factors that cumulatively can be described as the “road environment”, namely:

- Construction materials
- Climate/rainfall
- Hydrology
- Terrain
- Traffic/axle load
- Construction regime
- Maintenance regime

Rural road Pavement Selection

The procedures for the selection of low volume rural road paving are based on two key principles:

1. The pavements should be compatible with the governing road environment factors.
2. The pavements must be fit for purpose in terms of traffic volume and axle loads.

The above two principles are an extension of the approach to pavement design which is based predominantly on traffic/axle load and sub-grade strength. Experience indicates that additional road environment factors must be taken into account if the selected designs are to be cost-effective and sustainable in engineering, social and economic terms.

Appendix N - January 2007
**Rural Road Surfacing Trials Final Report**

**SEACAP1 Dissemination Workshop**

**Appendix N - January 2007**

---

### Primary Engineering Filter

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Seals and Load Bearing Surfaces</th>
<th>Bases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand seal</td>
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<tr>
<td>Chip seal</td>
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<td>Penetration macadam</td>
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<tr>
<td>Steel reinforced concrete</td>
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<tr>
<td>Bamboo reinforced concrete</td>
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<td>Concrete bricks</td>
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<td>Stone setts</td>
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<td>Unsealed gravel</td>
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<td>Waterbound macadam</td>
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<td>Drybound macadam</td>
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<td>Natural gravel</td>
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<td>Armoured gravel</td>
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<td>Cement stabilised soil</td>
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<td>Lime stabilised soil</td>
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<td>Emulsion stabilised soil</td>
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### Economically Available Materials

- Crushed stone aggregate: √√√√ √ √ √√ √
- Stone blocks: √
- Laterite gravel: √√ √
- Colluvial/alluvial gravel: √√ √
- Weathered rock: √
- Fired clay bricks: √
- Clay soil: √√
- Sand: √ √ √√ √√
- Cement: √√ √ √
- Lime: √
- Bitumen: √
- Bitumen Emulsion: √√ √

---

### Option Identification

Option suitability will depend on local circumstances and a formal system of assessment will enable unsuitable options to be filtered out before a short list goes forward to the design stage.

---

### THE ROAD ENVIRONMENT

- Drainage and Hydrology
- Prevailing Climate
- Available Materials
- Terrain Geography
- Sub-Grade Conditions
- The "Green" Environment
- Traffic Axle Loads
- Optimum or Appropriate Pavement Design
- Construction Regime
- Maintenance Regime

### Quality Assurance

Roads should be constructed with appropriate supervision and quality control

1. Materials approvals
2. Paveement layer approvals
3. In situ testing
4. As-completed Quality Assessment

### Construction Regime

- Contractor training: Construction methods
- Construction plant
- Local consultant strengthening
- Appropriate design
- Supervision
- Quality Assurance:
  - Materials control
  - Layer dimensions, strength
  - Drainage

### Maintenance Regime

Unrealistic assumptions are almost always made as to likely maintenance inputs, when planning road programs.

- The gravel survey in 2004 indicated that over 70% of roads were receiving no maintenance of any kind and less than 10% were receiving any form of periodic maintenance.
- Although the immediate focus may be on the absolute unsuitability of gravel as an option if no maintenance regime is in place. There is a longer term problem awaiting other surfaces – eg bitumen or emulsion seals
**Maintenance Materials**

Local or commune driven maintenance will tend to use immediately available local materials – from within the commune.

If original gravel is hauled 25-50-100Km ……?

**Summary**

Significant progress has been made in researching and recommending appropriate rural road options and already this has made significant and relevant impacts in the sector.

*The crucial follow-up phase is NOW*

*BUT*

Maintenance causing gravel surface deterioration to earth condition
**RRST Cost Norms**

**Basis for building the RRST cost norms:**
- Basic Construction Norms number 1242/1998/QD-BXD
- Repair Norms for Basic Construction number 29/2000/QD-BXD
- Road and Bridge Norms number 79
- Basic Construction Material Norms number 22/2001/QD-BXD
- Labour Norms Used during Construction by ILO, 1998
- Review of international experience

**Main Content:**

RRST Cost norms have been developed and used based on the following principles:
- New cost norms have been created for the special cases
- Some related available cost norms have been used without any adjustment
- Some related available cost norms have been adjusted to fit the new construction techniques and trial characteristics
- Comments have been collected from the stakeholders, especially from PDoTs & Local Consultants

**Available cost norms have been used for the following activities:**
- Activity 33: Shoulder Drainage Layer
- Activity 34: Sub-surface Drainage
- Activity 36: Gravel Sub-base
- Activity 42: Sand Bedding Layer
- Activity 46: Penetration Macadam Layer
- Activity 51a, 52a and 55a: Concrete Pavement
- Activity 52b: Steel Reinforcement
- Activity 51d, 52d and 55c: Formworks Installation and Re-installation

**New cost norms have been developed for the following activities:**
- Activity 35a: Natural Gravel Shoulders
- Activity 35b: Lime Stabilised Shoulders
- Activity 35c: Cement Stabilised Shoulders
- Activity 37a & 37b: Lime Stabilised Base/Sub-base
- Activity 38a & 38b: Cement Stabilised Base/Sub-base
- Activity 40: Dry Bound Macadam Base(s)
- Activity 41a: Amoured Natural Gravel Layer
- Activity 44 & 45: Sand and Chip Seal Layer(s)
Rural Road Surfacing Research (RRSR)
SEACAP 1
Trials Dissemination Workshop

Outputs, Future Work and Outstanding Issues

by
Robert Petts, BSc CEng MICE MIHT MIAgrE, Intech-TRL

Re-view: Where are we now?

| Identify need | Specifications, Norms & Standards |
| Construction research/compile knowledge | Road Authority practice |
| Initial Recommendations | Academic Institutions |
| Long Term Monitoring | Training-Mentoring |
| Disseminate | Practicing Engineers |
| Mainstream | Donor Programmes |
| Final Recommendations | Contractor enabling environment |
| + | International forums |

RRSR Outputs

The RRSR has allowed the following conclusions and recommendations to be made regarding rural road surfacing in Vietnam:

- A substantial and valuable database of rural road surfacing knowledge has been established for the wide range of (challenging) Vietnamese conditions, complementing previous rural road research,
- The Rural Road design approach should be improved to incorporate issues of road task, road environment, local materials available and maintenance regime,
- Gravel is inappropriate for many locations – its use should be restricted,
- A wide range of proven alternatives to gravel is available – with expected better Whole Life Cost, local resource use & maintenance attributes,
- Some paving techniques are robust; others carry more risk,
- A range of improvements to practices is required to achieve more cost-effective & sustainable investment in rural roads,
- Improved design of shoulders & earthwork slopes is also desirable,
- A requirement has been identified for more appropriate technical standards,
- Greater emphasis on appropriate surface selection is desirable at PDoT level,
- A Cost Model, Cost Norms and Standard Specifications have been developed for future management and technical application on rural roads in Vietnam.

RRSR Outputs, Continued

- A wide range of proven alternatives to gravel is available – with expected better Whole Life Cost, local resource use & maintenance attributes,
- Some paving techniques are robust; others carry more risk,
- A range of improvements to practices is required to achieve more cost-effective & sustainable investment in rural roads,
- Improved design of shoulders & earthwork slopes is also desirable,
- A requirement has been identified for more appropriate technical standards,
- Greater emphasis on appropriate surface selection is desirable at PDoT level,
- A Cost Model, Cost Norms and Standard Specifications have been developed for future management and technical application on rural roads in Vietnam.

Currently in process

Development of: -

- Guidelines on long term pavement condition monitoring
- Guidelines on supervision and contractor construction
- Recommendations for maintenance technical guidelines

Guidelines and training material: available February 2007

Appendix N - January 2007
The Way Ahead?

Substantial gains in Knowledge have been achieved by RRSR.

However, in general there is now a need for:
- Dissemination & Mainstreaming of this construction knowledge,
- Long term monitoring of the trials performance,
- Development of performance, maintenance and WLC knowledge.

This requires continuing commitment from the stakeholders.

Future Initiatives Required - 1

- Implement performance and maintenance monitoring of the trial roads to develop Whole Life Cost guidance (planned since project inception),
- Develop realistic VoC relationships for the Vietnamese types of transport and conditions, to assist surface option and road investment decision making,
- Develop further the RRST Cost Model to incorporate the full range of surface options and road environments, ............

Future Initiatives Required - 2

- Develop comprehensive rural road maintenance guidelines and Cost Norms for the range of surface options and environments,
- Revise the MoT Rural Design Guide,

Desirable Initiatives

Further desirable initiatives include:-
- Repeat surveys of RRGAP,
- Rural Sealed Road Assessment Programme (RSRAP),
- International Dissemination of RRSR knowledge:
  e.g. http://www.gtkp.org/

Future Key Actions

Initial Recommendations: Workshop & Report
Long Term Monitoring
Final Recommendations
THIS ALL REQUIRES PLANNING + RESOURCES
Specifications, Norms & Standards
Road Authority practice
Academic Institutions
Training-Mentoring
Practicing Engineers
Donor Programmes
Contractor enabling environment
International forums
Disseminate + Mainstream

Appendix N - January 2007
**INTRODUCTION**

- What is IFRTD?
  - Basic principles
  - Activities
  - Structure

- What have we learned?
  - Knowledge generation
  - Information sharing & dissemination
  - Advocacy
  - Networking

**WHAT IS IFRTD?**

- **A southern driven global network of people and organisations committed to reducing poverty and isolation**

- **Comprising**
  - 3500 members in over 100 countries
  - 27 national networks or National Forum Groups (NFGs)

- **Supported by**
  - Voluntary contributions of time and effort by members
  - SDC, DFID (gTKP) and Sida for coordination & network governance
  - A host of other donors for national and international activities: including national governments, World Bank, Ireland Aid, ILO, international NGOs etc.

**Vision and Mission of IFRTD**

**Our Vision:**
Poor and vulnerable communities in developing countries are able to improve their lives through enhanced mobility, access and economic opportunity.

**Our Mission:**
As a Southern-driven global network IFRTD works to improve policies and practices in transport operations, infrastructure, access and service provision that will benefit the lives of poor rural communities in developing countries through dialogue, information sharing, capacity building, research and advocacy.

**Basic Principles: breaking the barriers**

- **Facilitating dialogue** between people from different levels and geographical locations
- **Challenging people** to take a holistic and multidisciplinary view of transport and development
- **Creating opportunities** for all stakeholders to participate in the international production of knowledge.

**Activities Strategy 2007-2011**

- Knowledge generation
- Information sharing & dissemination
- Partnerships
- Advocacy
Knowledge Generation
“networked research”

• Balancing the Load: gender and rural transport issues (1998) – supported by DFID KAR
  – 31 case studies from 15 countries in Asia and Africa

• Waterways and Livelihoods (2002)– supported by DFID KAR
  – 10 country case studies from Asia, Africa and Latin America
  www.ruralwaterways.org
  ruralwatertransport@yahoo groups.com

• Mobility & Health assessing links between rural access and health focusing on maternal mortality in Asia, Africa and Latin America
  9 case studies in Asia from Nepal, Pakistan, Bangladesh, India and Indonesia. www.mobilityandhealth.org

Partnerships
working together

• DFID Transport Resource Centre: with TRL, ITDG, NRI
  – Poverty and transport paper
  – Review of PRSPs
  – Catalogue of Intermediate Means of Transport
  – Web monitoring initiative

• Integrating Gender into World Bank Financed Transport Programs: with TRL & IC Net, Japan– formation of GATNET

Partnerships contd..

• Assessing the Demand for Information in Rural Transport and Infrastructure: with Commsconsult & ODI – used in Global Transport Knowledge Partnership (gTKP)

• International and Regional partnerships e.g. with World Bank

• Partnerships with other networks:
  Animal Traction Network for Eastern and Southern Africa (ATNES) Sustainable Transport Action Network for Asia and the Pacific (SUSTRAN)

Information sharing
sharing perspectives

• Forum News – quarterly newsletter
• Web site - www.ifrtd.org
• Publications:
  – Roads are not enough
  – Networking for development
  – Annotated Bibliography on rural transport
  – Balancing the Load: women, gender and transport published by Zed Books

• Workshops e.g. Improving Mobility for the Rural Poor series of regional seminars

• Email discussion lists:
  – rural-transport-development@jiscmail.ac.uk
  – gatnet@dgroups.org

Partners of Work in Asia

Existing Partners (Regional/Intn’l focused)

• SUSTRAN Asia & Pacific
• ILO ASIST
• SEACAP (South East Asia Community Access Program)
• UNOPS
• Practical Action (INGO)
• PIARC C2.5 (World Road Association)
• IFG on Rural Road Engineering

Recent networking activities in the Region

• Coordinating World Bank Asia Regional Workshop to develop transport sector indicators in 2005.
• Linking India’s PMGSY (National Rural Road Programme) with Sri Lanka Rural Roads programme.
• Provided IMT/NMT Bibliography to PIARC C2.5
• Linking the Ministry of Provincial Council and Local Government of Sri Lanka to get training in rural roads with Bangladesh and Indian authorities and relevant institutions in Vietnam and India.
Recent networking activities in the Region Contd…

- Got the Sri Lanka NFG to conduct a workshop on rural transport to the Ministry officials.
- Used the network to respond to technical queries from gTKP.
- The Asia Network members in Nepal has requested Bangladesh to provide training to Nepalese Engineers on Rural Road Maintenance Management systems.

ADVOCACY

lobbying for change

- Changing national policy
  - Kenya – reducing tax on bicycle imports
  - Tanzania – dialogue with parliamentarians
  - Sri Lanka – getting rural transport into the national transport policy, recognition for dual-purpose vehicles

- Improving practice
  - Toolkit on Promoting the sustainability of Rural Transport Infrastructure (with SDC)
  - Civil society monitoring the poverty impact of transport investments
  - Cambodia – community monitoring of WB transport investments

- PMGSY (PM’s Rural Road Programme), India

- Highlighting ignored issues - Gender, Rural water transport

ORGANISATION

Membership

- General membership: people & organisations
  - Individual
  - Institutional: donor agencies, international NGOs, research organisations, local NGOs, private sector, user organisations

- National Networks
  - ASIA: Bangladesh, Cambodia, India, Indonesia, Nepal, Philippines, Sri Lanka, Pakistan and starting in China and Lao PDR. Vietnam??
  - AFRICA: Burkina Faso, Côte d’Ivoire, Congo, Chad, Ethiopia, Guinea, Kenya, Rwanda, Senegal, South Africa, Tanzania, Togo, Uganda, Zimbabwe
  - LATIN AMERICA: Cuba, Colombia, Nicaragua, Regional network

ORGANISATION (GOVERNANCE)

- NFG representatives, donors, institutional member representatives (incl. Founder members)- Advisory Committee
- From 2003- Executive Committee
  - 8 NFG representatives, 2 from each region
  - 7 coopted members of which at least one should be a core donor

SECRETARIAT

- Eastern & Southern Africa - Nairobi, Kenya
  - Peter Njenga
- West & Central Africa – Yaoundé, Cameroon Gay Komtso
- Latin America – Lima, Peru
  - Ana Bravo
- Asia – Colombo, Sri Lanka
  - Ranjith de Silva
- International coordination – London, U.K.
  - Maritime van Riet (Executive Secretary)
  - Kate Cruzman (Communications)
  - Simon Chouffot (Administrator)

LESSONS LEARNED

Knowledge

- Knowledge resides in people
- Creation of knowledge requires people to be involved
  - Setting the agenda
  - Participating in the process
  - Having opportunities for sharing & critical debate
LESSONS LEARNED

Information sharing

- “Web is not enough”
- Interactive forms of communication
- Participatory workshops that provide forums for exchange and debate
- Governance structure is southern-led to enable dialogue north-south
- Send information on request and/or link up parties together.

LESSONS LEARNED

lobbying for change

- Get influential people involved in the network
- Convince people who have access to influential people
- Make a case – role of ‘evidence’

LESSONS LEARNED

networking & partnerships

- Ownership takes time
- Multi-disciplinary teams essential to achieve goals
- Transparency essential, especially when financial resources are available

Thank you

Ranjith de Silva
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Phone: +94 11 2 842972
Email: ranjith@ifrtd.org
Web: www.ifrtd.org
**SMP's OBJECTIVES**
- Refresh the understanding and purpose of SEACAP;
- Share experiences from the implementation of SEACAP projects;
- Review achievements and progress to date;
- Consider future direction and priorities for SEACAP.

**AUDIENCE** - About 70 participants comprised presenters, officials and consultants from:
- Ministry of Rural Development and other transport development partners in Cambodia,
- SEACAP practitioners, consultants and implementers from Vietnam and Lao PDR
- and delegations from non-SEACAP countries; namely Bhutan, Sri Lanka, and Afghanistan.

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**How was the Meeting organised?**
- **Country Update Report:** Presentation by implementers and consultants from each SEACAP’s Countries about achievements, lessons learn and progress to date of SEACAP Projects;
- **Working Groups:** 2 Working Groups were formed for discussion on two different subjects:
  - Subject for Group A was to consider and investigate the Gaps of Current Research and Knowledge relating to Rural Access
  - Subject for Group B was to identify the Challenges for Dissemination and Mainstreaming of SEACAP.
- **Open Discussion** - 3 keys issues were identified and discussed:
  - Definition of Access and Rural Access;
  - How Should SEACAP interact with different countries?
  - How we could better network?
- **Projection of SEACAP Documentation Films** followed by discussion.

---

**Outcomes of Group A**
- **Maintenance and funding issues.** Maintenance and funding and other related issues were identified as key issues. Most countries that participated in this group expressed their concern about the knowledge gap regarding the issues of maintenance. The group also recommended that investigations on maintenance programmes and funding issues should be implemented as a research project and not purely as the implementation of a maintenance project.
- **Traffic patterns and overloading** was another common topic that was identified as needing to be addressed. A design guideline to deal with traffic patterns and overloading environment and risk is needed.
- **Whole-life cost comparison:** A number of research gaps that were identified in and around the issue of whole-life costing. The research should lead to development of an appropriate model of whole-life cost comparison.
- **Actual rural community benefits and other associated topics** were other important points identified. The research should lead to development of an appropriate way to quantify the actual community benefits and other impacts from rural road investment.
- **Lack of institutional strengthening and monitoring.** The research should aim to define a suitable regime to carry out this in a sustainable way.

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**Outcomes of Group B:** The issues of Dissemination and Mainstreaming was actually quite a difficult and complex process and the time available was not sufficient for the group to complete this exercise. The group recommended that this should be an ongoing process for SEACAP’s Management to address in the coming month within individual countries
- **Group B recommendations** were that SEACAP should have effective dissemination strategies for:
  - Technical and academic practitioners but to aim to also reach the most influential people such as politicians, the Prime Minister or President in each country.
  - This group also found that dissemination alone is not enough. We can tell people about good things, but decision makers are often afraid of, or constrained from, adopting new ideas. There is a risk involved. If they promote something and it does not work, they will be responsible. Therefore those risks should be removed or minimised through broadcasting and mainstreaming of SEACAP activities. Knowledge and experiences gained from research and studies should be transformed into standard practice for people at technical levels to adopt;

---

**Recommendations and Suggestion from SMP Meeting**

**Related to SEACAP Management and Interaction with SEACAP Countries:**
- The meeting highlighted the need for improved interaction between SEACAP Management and the host Governments. There were comments on the needs for wider consultation in the creation of future SEACAP projects especially with the Ministry or department of the host government, in order to improve ownership and better response to the needs of the specific challenges for each country.
- The Meeting suggested that SEACAP should have clear guidelines for the procurement of services and timetables for SEACAP project cycles so that other SEACAP partners are able to plan accordingly.
Related Recommendation on technical issues:

SEACAP projects are predominantly research projects. In contrast there are standard projects where projects are for delivering new road or improvement existed road network and the project is finished with the completion of construction. In these cases there are no on-going elements that need to be kept alive, unlike a research programme.

In research programmes there has to be:

A) a certain open-ended approach in the framework.
B) They has to be a great deal of flexibility within interpreting the ToR because sometimes with research you are in a situation with completely different situations/conditions occur compared to what was initially envisaged. Flexibility has to be accommodated within the in the project and contract framework.

The comment was well received and SEACAP management will consult with DFID regarding this suggestion.

Regarding the improvement of networking among SEACAP practitioners:

- The meeting recommended that SEACAP should initially share information regarding proceedings within each country.
- A list of contacts of SEACAP practitioners should be prepared and circulated.
- Information relating to SEACAP projects and reports should be circulated and posted on the website.

Suggestions were received that it is a good idea to keep the current local websites that have been already established with support from SEACAP. These should be maintained and continue to function until a better knowledge exchange solution is found, however the participants believed that there would always be a use for a local website providing local information that would not otherwise be available.

Regarding the extension of SEACAP Programme to other countries in Asia: Delegation from Sri Lanka, Bhutan and Afghanistan expressed their interest and recommended SEACAP Programme to extent to their countries.

Report of SEACAP Practitioners Meeting is available on
http://www.cnctp.info/SMP-Meeting.htm

Thank You
Speech at Official Closing
Rural Road Surfacing Research
SEACAP 1 Dissemination Workshop

by Dr. Nguyen Van Nhan
Director of Department of Science & Technology - MoT
Chairman of RRST Steering Committee

Ladies and Gentlemen,

In the inspiring atmosphere of the successful APEC Conference and Vietnam becoming official member of WTO, we are honoured to give warm welcome to the delegates from regional countries, our donors, the engineers, experts and consultants of transport and other sectors to participate in SEACAP 1 Dissemination Workshop under the Rural Road Surfacing Research Programme.

As you know, natural calamity, war... are dangerous menaces to mankind, however, poverty is the daily threat which is most difficult to overcome and bring immeasurable consequences. That is why there are many projects funded by international organisations and developed countries to alleviate poverty, improve living standards and promote the developing economies. Rural transport is one of universally interested areas as it has strong impact on the living of the poor.

However, it is not easy to select and construct roads appropriate to hydrogeology and climate circumstance of each region, as there have not been particular researches on this issue in Vietnam and in the other regional countries either. Thus, taking account of saving labour, time and money for such kind of research, a knowledge dissemination workshop like this one is very important and useful. In this workshop, we can exchange not only the experience of selecting an appropriate road surface, but also the experience of rural road construction and management with many experts, consultants of transport and other sectors from Vietnam and regional countries. This makes the topic of our workshop much more interesting and effective. I believe that after one day of fervent and open discussions, each participant has drawn valuable experiences useful for his field of work and can be applied for his region, country.

For Viet Nam in particularaly, during the site visit to Hung Yen and Ninh Binh provinces tomorrow, you will see the achievement of poverty alleviation that is gained through investment in rural transport, especially in Rural Road Surfacing Trials implemented by Intech-TRL under Rural Transport 2. The previous small paths that hardly allowed traffic in both rainy and dry weather have been replaced by new smooth roads with different surfaces such as cement concrete, bamboo-reinforced cement concrete, bitumen sealed stabilised sand base... made using local available materials. These new trial roads, together with local natural landscapes and historical monuments, create very beautiful rural scenery and make a great contribution to the local economic development. We do hope that these trial surfacing options will be applied in a large scale in Vietnam, and gradually replace gravel roads previously constructed.
On behalf of the leaders of Ministry of Transport, I would like to express our sincere thanks to the World Bank and DFID – the donors of this programme, and appreciate the valuable contribution of Intech-TRL to our Rural Road Surfacing Trials in 12 provinces of Viet Nam. I would also like to thank you all international and domestic delegates for your participation in our workshop. We are in hope that more research on transport will be funded and supported by our donors and consultants, and there will be more opportunities for us to cooperate and exchange knowledge with regional and international colleagues.

Hereby I would like to declare the close of the SEACAP 1 Dissemination Workshop.

Thank you.
SEACAP 1

FINAL REPORT

APPENDIX O

RRST-II Socio-Economic Data
INTRODUCTION

Socio-economic information relating to the RRST-II options was collected by ITST as part of their Module 2 contract. ITST used similar field forms to those developed by TDSI for the RRST-I survey which was carried out under direct Intech-TRL supervision. No collation or interpretation of the information was undertaken by ITST in their final reports. Intech-TRL has undertaken some limited collation of the ITST information and this is presented in this Appendix in Tables O1 to O4.

Intech-TRL had no responsibility for the Quality Assurance of this data and it is recommended that a suitably qualified consultant review both raw data and the collation tables.
### Table O1: Information from Contractors and Supervisors -1

<table>
<thead>
<tr>
<th>Province</th>
<th>No. of Interviews</th>
<th>% Construction Cost within Commune</th>
<th>Enough Instruction</th>
<th>Technology Transfer</th>
<th>Community Objections</th>
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<td>5</td>
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### Table O2: Contractors- Supervisors Option Preferences

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<th>Province</th>
<th>No. of Interviews</th>
<th>First Preference Option</th>
<th>2nd Preference Option</th>
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<tr>
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**Key**

- a Unsealed gravel
- b Dry-bound macadam
- c Dressed stone setts
- d Stone chip emulsion seal
- e Sand emulsion seal
- f Penetration macadam
- g Fired clay bricks
- h Concrete bricks
- j Bamboo reinforced concrete
- k Steel reinforced concrete
### Table O3: Community Road Users -1

<table>
<thead>
<tr>
<th>Province</th>
<th>No. of Interviews</th>
<th>Means of Transport</th>
<th>Impact of Improved Rural Access</th>
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<td>72 63 60 60 60 60 56 37</td>
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**Key**

- **Means of transport**
  - a Walking
  - b Bicycle
  - c Motorcycle
  - d Hand-cart
  - e Animal-cart
  - f Cong Nong
  - g Saloon car
  - h Truck
  - i Bus/Minibus

- **Impact of Improved Rural Access**
  - a Easier personal movement
  - b Reduction in transport costs
  - c New job opportunities
  - d Increase in sources of income
  - e Improved export of agricultural and other goods
  - f Increased access to hospitals, schools, banks etc
  - g Encouragement to investment in the area
### Key

**Methods of Maintenance Contribution**

- **a**  Labour contribution
- **b**  Annual contribution (tax)
- **c**  Paid labour

### Table O4: Community Road Users - Maintenance

<table>
<thead>
<tr>
<th>Province</th>
<th>No. of Interviews</th>
<th>Involvement in Maintenance</th>
<th>Agree with Payment for Maintenance</th>
<th>Willing to contribute to improved access</th>
<th>Method of Contribution</th>
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**Percentage**

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<th>64</th>
<th>36</th>
<th>83</th>
<th>17</th>
<th>93</th>
<th>7</th>
</tr>
</thead>
</table>

Table O4: Community Road Users - Maintenance