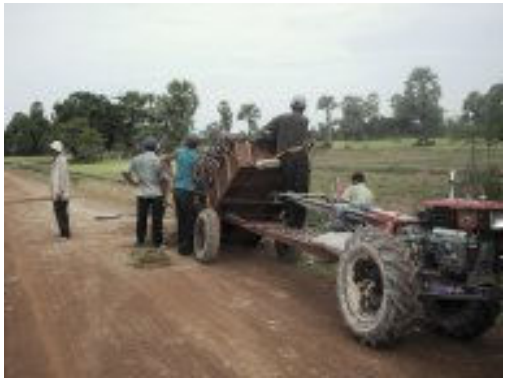

REPORT NO. 06181/4

ENHANCING THE USE OF LOCALLY MADE, LOW COST EQUIPMENT FOR THE ROAD SECTOR (SEACAP 020)

TERMINAL REPORT (DRAFT)

NOVEMBER 2008

BY

itt

ITT REPORT 06181/4

ENHANCING THE USE OF LOCALLY MADE, LOW COST EQUIPMENT FOR THE ROAD SECTOR (SEACAP 020)

TERMINAL REPORT

This document is an output from a DFID financed project. The project has been implemented by IT Transport Ltd with assistance from Khmer Consultant Engineering Corporation (KCEC) of Cambodia and Institute of Science, Transport & Technology (ITST) of Vietnam. The views expressed are those of the author(s) and not necessarily those of the funding agency.

ITT LTD.
The Old Power Station, Ardington, Wantage, OX12 8QJ, UK
2008

CONTENTS

Page No

ABBREVIATIONS

DFID	Department for International Development (UK)
ILO	International Labour Organization
ITST	Institute of Science, Transport & Technology
ITT	I.T. Transport Ltd.
KCEC	Khmer Consultant Engineering Corporation
KII	Key Informant Interview
LAK	Laotian Kip
Laos	Lao People's Democratic Republic
MRD	Ministry of Rural Development (Cambodia)
NGO	Non Governmental Organisation
RT2/RT3	Second/Third Rural Transport Project
SEACAP	South East Asia Community Access Programme
SSC	Small Scale Contactor
TOR	Terms of Reference
TRL	Transport Research Laboratory (UK)
VND	Vietnamese Dong

******

Currency Equivalents (as of April 30, 2008)

CAMBODIA
1 US$ = Approx. 3,920 Riels
1 €= Approx 6,140 Riels
1 UK£ = Approx. 7,800 Riels

***

VIETNAM
1 US$ = Approx. 16,100 VND
1 €= Approx 25,200 VND
1 UK£ = Approx. 32,000 VND

***

LAOS
1 US$ = Approx. 8,700 LAK
1 €= Approx 13,700 LAK
1 UK£ = Approx. 17,300 LAK

EXECUTIVE SUMMARY

1. This report (the terminal report) is one of the outputs of the study entitled "Enhancing the Use of Locally Made, Low Cost Equipment for the Road Sector" undertaken in three countries: Cambodia, Vietnam and Laos. DFID's South East Asia Community Access Programme (SEACAP) has financed the project. The main project objective is to identify ways to improve the availability and accessibility of equipment that is necessary and appropriate for the rural road technologies that are emerging from SEACAP projects.
2. Other outputs of the project included a combined report of the three modules of the project: the survey module, the towed-grader module and the mobile small scale stone crusher module. A new chapter has been produced for the Development Engineering Course and the Rural Development Course at the ITC, and an information pack summarising the outputs of the study has also been produced.
3. The report presents the outcomes and impact of the project including the lessons learned.
4. The main study conclusion is that the current supply and demand of construction equipment linked to the rural roads sub-sector are balanced. It is also expected that the market will be able to meet the future potential equipment demand in relation to the planned development of rural roads in those countries. Therefore, there is no major cause for concern in this respect.
5. The ToR for the study was found to be very detailed and specific. There are a few minor issues linked to the project design, stemming from the scope of the ToR, the selection of contactors, the activity sequence and the towed-grader models. However, they seem not to have affected the study outcome adversely.
6. A number of lessons were learnt from the project, including:
    i. The consultants found that a simple and targeted questionnaire is more amenable to the SSCs. Therefore, in a study that deals with SSCs the design of the questionnaire should be carefully thought through and pre tested so that it is not too complicated;
    ii. Use of a structured questionnaire in combination with in-depth interviews (with a sample of respondents) has been found to be very useful in understanding the issues faced by SSCs. The in-depth interview information was also used to explain results of the structured questionnaire analysis.
    iii. The consultants found the de-briefing seminar valuable in the finalisation of the study;
7. There is a requirement to undertake more activities in future to address a number of issues including:
    i. Equal opportunities of private sector versus public sector contractors in the rural roads sub-sector in Vietnam given that the State Owned Enterprises are often favoured by the client in the allocation of contracts.
    ii. Difficulties in market entry for SSCs in the road sector in Laos.

1. INTRODUCTION

1.1 Background

A series of Department for International Development (DFID), UK funded research projects are currently being implemented in Cambodia, Laos and Vietnam. DFID is funding them under its South East Asia Community Access Programme (SEACAP). SEACAP identifies ways to improve sustainable access to rural communities to facilitate access social and economic facilities and services, thereby creating opportunities for pro-poor growth and poverty alleviation. The objective of the Programme is *"Livelihoods of poor and vulnerable people in SE Asia improved sustainably"*. SEACAP encourages initiatives that allow roads to be constructed and maintained in a sustainable way by local people using local materials, local labour and skills, local enterprises and simple, low cost equipment.

1.2 The Study and the Terminal Report

This report is one of the outputs from the SEACAP 020 project, Enhancing the Use of Locally Made, Low Cost Equipment for the Road Sector. The main objective of SEACAP 020 is to identify *"ways to improve the availability and accessibility of equipment that is necessary and appropriate for the rural road technologies that are emerging from SEACAP projects"* and that such *"equipment will be "appropriate in cost and size for (SSCs) small-scale contractors involved in the rural road construction and maintenance"*. SEACAP 020 activities mainly revolve around four modules: (i) Survey; (ii) Towed Grader; (iii) Mobile Small Scale Stone Crushers; and (iv) Dissemination and Mainstreaming. The project activities were carried out in three countries, Vietnam, Cambodia and Laos, although the main focus of the project was in Cambodia. Appendix I presents the Terms of Reference (ToR) of the study.

A number of activities have been carried out for the dissemination of the results of the study including the organisation of a number of seminars, at the inception and final stages of the project, to inform the stakeholders of the project's outcome, development of a lecture module for ITC to be used by the Development Engineering Course and the Rural Development Course at the Institute, and the development of an information package for the SSCs with the key findings and outcome of the project.

This report (the terminal report) of the project is one of the project's reporting requirements. The objective of the terminal report is to recount the outcomes and impacts of the project including the lessons learned, issues linked to the project design and difficulties encountered in the implementation of the project.

2. ACTIVITIES, OUTCOMES AND IMPACTS

2.1 Project Activities

A number of activities were conducted in the project including: (i) contractor surveys; (ii) key informant interviews (KIIs); (iii) in-depth interviews/case studies; (iv) development of equipment performance and cost models; and (iv) general analysis. These activities are described in the following paragraphs.

Contractor surveys: The contractor survey provided the main source of data for the study. The objective of the exercise was to ascertain the commercial behaviour of contractors regarding the purchase and use of road construction equipment. A detailed questionnaire was developed for this purpose. This questionnaire was administered face to face by trained enumerators.

The Terms of Reference (TOR) of the study provided a list of SSCs to be included in the study: 22 Cambodian SSCs trained by the International Labour Organisation (ILO) upstream project and 42 Vietnamese contractors who carried out work on the Second Rural Transport Project (RT2). From the original list, only four Cambodian contractors and 33 Vietnamese contractors were successfully identified and interviewed. Where the contractors could not be interviewed from the original list (because the contractor no longer operated or was not able/willing to be interviewed), they were replaced by additional small-scale contractors. This involved establishing a set of criteria, with the help of local experts, for each country (see the combined module report for the contractor selection criteria).

A total of 79 contractors were interviewed (Table 1). Thirty-nine of them were from Cambodia and forty were from Vietnam. No Laotian contractors were surveyed because none could be found for a number of reasons including the nascent nature of the construction industry (the combined module report provides details). However, two building construction contractors were interviewed to further understand the problems facing the SSCs in the rural road sector market.

Table 1: Extent of activities in this study

Activity	Cambodia	Vietnam	Lao	Total
Contractor surveys	39	40	None	79
Key informant interviews	13	9	5	27
Equipment supplier interviews	8	7	7	22
In-depth contractor interviews	2	1	2	5

Key Informants Interview (KII): A series of interviews, using a structured questionnaire, were conducted with experts in the rural road sector in order to establish their views on the necessary equipment. They were designed to complement the contractor surveys and provided valuable in-depth information on the construction industry in the rural road sub-sector and issues linked to the use of equipment.

In-depth Interview & Case Studies: In addition to the contractor surveys and KIIs, a number of in-depth interviews were carried out with contractors in Cambodia and Vietnam. The objective was to gain in-depth understanding of their views on a number of issues including the operational problems they faced in their commercial/business environments. A total of three contractors were interviewed in-depth (two in Cambodia and one in Vietnam). In addition, two contractors in the building construction industry were interviewed in Laos.

Equipment Performance Model: A spreadsheet-based equipment cost model was developed for the study to estimate unit equipment operating costs. The model utilises a number of inputs including purchase costs, operating life, utilisation rates, interest rates, costs of different inputs (e.g. fuel, lubricants, operator wages etc.).

Other General Analysis: A thorough search of relevant secondary sources was performed and the relevant documents were reviewed in the study. Such information has complemented the information collected from primary sources.

The study also organised a number of seminars in the study countries: one during the inception phase (in Cambodia) and three seminars in the implementation phase (in Cambodia, Vietnam and Laos). The objective of the inception seminar was to present the inception findings. The implementation phase seminars presented the study findings to the stakeholders and sought their views and further comments. The implementation phase summary seminar report is annexed in Appendix II.

2.2 Project Outcomes & Impacts

A summary of the project findings is provided in Appendix III. The main findings are:

- Equipment ownership among the contractors was found to be high. The contractors also hired in equipment.
- In general there are no significant equipment supply constraints in Cambodia and Vietnam. However, there exists a spatial constraint in the supply of relatively sophisticated equipment which tends to be only sold and serviced in large cities.
- Among the study countries only Vietnam has a substantial manufacturing potential. However, evidence suggests that Vietnam is facing stiff competition from Chinese manufacturers at the higher end of the market.
- Contractors in the region do not import equipment directly; they usually depend on dedicated importers for overseas equipment purchase.
- The overwhelmingly source of equipment finance is provided by private capital. Only a small minority of them financed equipment purchase using formal credit.
- Although SSCs face no major problems in entering the rural road sub-sector market in Vietnam and Cambodia, there is a cause for concern in Laos where evidence suggests an unfavourable climate for existing small-scale contractors and for market entrants.
- Large and medium sized motor graders are widely available and used for roadworks in the region. Small motor graders (less than 120 HP) were rare. Only two types of towed grader were available (mainly in Cambodia): the CamGrader and the Simba.
- A cost-effectiveness analysis suggests that the Simba, Cam Grader and small motor graders are the most cost-effective equipment depending on a number of factors (e.g. on which type of roads they are used, their utilisation rate and whether they are purchased new or second-hand).
- The number of graders that will be required per year to implement the planned roadworks in Cambodia and Laos is estimated to be low (each country will require less than 10 units of motor and towed graders). The grader demand is higher in Vietnam (over 180 motor graders and 270 towed graders will be required per year).
- Analysis suggests that the existing stock of motor graders appears adequate to meet the likely future demand from the rural roads sub-sector over the next five years.
- Mobile crushers owned by the contractors in the region were of the jaw crusher variety. They are lighter and have a simple crushing mechanism.

- Among the three viable alternative options (hand knapping, using a mobile crusher and purchasing from a commercial quarry), mobile crushers are found to be the most cost-effective. However, hand knapping is the best option when the required volume of broken stone is low or if the construction site is remotely located. When the quality of required crushed material is high and/or there is a special technical requirement, purchasing from a commercial quarry may become the only option available to the contractor.
- The current demand for mobile crushers is high in Vietnam but low in Cambodia and Laos. The potential demand for mobile crushers linked to the rural roads sub-sector in Cambodia and Laos is also relatively low. The potential demand in Vietnam is high. Evidence suggests that currently there is no crushing equipment supply constraint in the region.
- There is overwhelming evidence from the region that suggests that the market will be able to match the future demand with adequate supply of crushing equipment.

3. COMMENTS ON PROJECT DESIGN & LESSONS LEARNED

3.1 Comments on the Project Design

i. The ToR for the study was found to be very detailed and specific. The project has dealt with a number of issues (ranging from identification of appropriate equipment to the assessment of their demand and supply; the estimation of their unit cost to the assessment of particular equipment in-depth) In many cases while undertaking the ToR activities, other issues and concerns emerged which had not been identified in the ToR. This made the project more challenging and required careful management if the ToR were to be achieved.

ii. The project design provided two contractor lists: one each for Vietnam and Cambodia. The ToR required the Consultants to include "at least" the contractors from the lists. Many of the contractors from both lists could not be interviewed due to a variety of reasons including the contractors' unwillingness to be interviewed. The study had to devise selection criteria in order to identify additional contractors. Although the logic of including a list of contractors in the ToR is understood, the sample of contractors would have been more homogeneous had the study selected contractors based on the criteria developed at the start of the study. Unfortunately, the issue could not be identified in time to adopt appropriate mitigation measures. Nonetheless, it is difficult to comment on the how this has impacted on the project outcome.

iii. The project had four modules: the survey, the towed grader, the mobile small scale stone crusher, and a module on dissemination and mainstreaming. This proved to be an ambitious task and in our opinion the scope of the study should have started with an exploration of general issues related to the adoption and use of low cost equipment through the survey module. These findings could then have been used to identify which specific equipment should be investigated in detail. This is exemplified by the small scale mobile stone crushers, which are very relevant to Vietnam, but not to Cambodia and Laos. The open ended survey approach would have identified this issue and suggested such equipment as a stand alone research topic for Vietnam alone. The Consultants had re-adjusted the investigation sequence during the course of the study. However, it does not appear to have any adverse effects on making valid study conclusions.

iv. The ToR required the Consultants to focus their attention on two towed-grader models. Only a few units of Simba and CamGrader type towed graders (most probably less than 10 units) are available in the region. An alternative could have been the identification of towed graders best suited to the region, including the ones available. It is likely that the Cam Grader would have been included because it is produced in the region, but the Simba could have been replaced by other, mainly cheaper models (available in Africa). However, it is difficult at this stage to state with certainty that it would have led to different conclusions in relation to the towed graders.

v. The ITC Lecture module is a cost effective way to disseminate the findings and to pass the message across to future civil servants and practitioners.

3.2 Main Lessons Learned

i. The Consultants had designed the data collection instruments linked to the survey module twice. The analysis of the contractors' responses of the first data collection instrument showed that the instrument was too complicated for the contractors to

respond appropriately. A simplified and more targeted questionnaire was designed subsequently and was piloted before its use. The contractors were found more forthcoming in responding to the second questionnaire and their responses were found to be robust. The main lesson learned is that data collection instruments designed for collection of data from SSCs need to be simple and targeted.

ii. Section 2.1 shows that the additional in-depth interviews conducted with a few contractors from the same sample in Cambodia and Vietnam were very useful to better understand the business environment in which the SSCs worked. It also complemented the information collected using the structured questionnaire. Given that small-scale road contractors could not be identified in Laos, the substitution of building contractors was valuable. This approach also provided useful information in relation to the difficulties faced by the SSCs in the construction sector as a whole. Therefore, a combination of interview using a pre-defined questionnaire along with unstructured in-depth interview helps our understanding the issues faced by the SSCs. Also in-depth interview information provided useful insights to explain the results of the structured questionnaire analysis.

iii. The de-briefing seminars, in general, proved to be a valuable exercise. The seminar inputs have substantially helped the Consultants in the finalisation of the project reports.

3.3 Suggested Future Activities

The main conclusion from the discussions of Section 2.2 is that the current supply and demand of construction equipment linked to the rural roads sub-sector are balanced. It is also expected that the market will be able to meet the future potential equipment demand arising from the planned development of rural roads in those countries and there is no particular cause for concern. However, during the dissemination seminars the following issues were raised by the participants:

i. A detailed investigation on different aspects (current and potential use, technical aspect, operating costs, regulatory issues etc.) of *Cong Nong* (a makeshift haulage equipment), which has considerable importance in Vietnamese context. Global Transport Knowledge Partnership (gTKP) has recently financed a research project to document the knowledge of *Cong Nong* in Vietnam, including their benefits and contentious issues. The research appears to have covered most of the technical and commercial aspects of the vehicles. Therefore, it is felt that it is not necessary at this stage to conduct further investigation of the equipment, unless specific issues emerge in future.

ii. Another issue that was raised by the Vietnamese participants is the uneven competition between private and public sectors. The Vietnamese participants have sought the resolution of the issue. A study in 2005 on the role of private sector in rural transport (Mekong Economics, 2005) also highlighted the issue of bias towards the State Owned Enterprises in the allocation of contracts.

iii. The study also identified difficulties in market entry for SSCs in Laos. This was highlighted in the combined report (ITT, 2008). Workshop participants in Laos even proposed a policy of "positive discrimination" by the public sector to ease the entry of small-scale contractors into the industry till the industry matures.

REFERENCES

ITT Ltd. (2008), *Enhancing the Use of Locally Made, Low Cost Equipment for the Road Sector (SEACAP 020): Combined Module Report*, ITT Ltd., Ardington

Mekong Economics (2005), *Research into the Role of the Private Sector in Transport*, SEACAP 014, May 2005

APPENDICES

APPENDIX I

TERMS OF REFERENCE

ENHANCING THE USE OF LOCALLY MADE, LOW COST EQUIPMENT

FOR THE ROAD SECTOR

June 2006

1. BACKGROUND

A substantial programme of DFID funded research projects is underway in Cambodia, Laos and Vietnam. At the present projects operate under the South East Asia Community Access Programme (SEACAP). SEACAP identifies ways to improve sustainable access to rural communities to facilitate access to health, education, trade, social facilities and services, thereby creating opportunity for pro-poor growth and escape from poverty.

The objectives of the Programme are "Livelihoods of poor and vulnerable people in SE Asia improved sustainably" and include empowering local ownership of access. This includes initiatives that allow roads to be constructed and maintained in a sustainable way by local people using local materials, local labour and skills, local enterprises and simple, low cost equipment.

- This project is aimed at identifying the ways to improve the availability and accessibility of equipment that is necessary and appropriate for the rural road technologies that are emerging from SEACAP research projects. The objective is to develop simple equipment solutions for road construction or maintenance operations, for which labour is not suited due to technical work difficulty, quality control, economic or safety constraints. Furthermore the intermediate equipment should avoid the need to use expensive or sophisticated, capital intensive, imported (new or second hand) equipment.
- The equipment will therefore be appropriate in cost and size for Small-Scale Contractors involved in rural road construction and maintenance. In this regard the equipment should be suitable for as many construction operations in addition to roadworks as is possible. SSCs are usually involved in a variety of construction operations[1] therefore it is necessary that any equipment that SSC purchase have wide varieties of applications.
- Using local equipment options should create, and build upon existing, availability, local capacity to manufacture and use such equipment, thus creating employment in fabrication and road construction/maintenance enterprises. There should also be substantial benefits from lower unit costs of the works and avoidance of capital investment in foreign plant. The work will draw from experiences of intermediate equipment (such as small trucks, towed graders, concrete mixers, soil stabilisation equipment) in other developing countries. Research should also be based on current experience and knowledge of developments and manufacturing capacity in the target countries.
- Two important considerations are the specification of this equipment in tendering documents and the ability of SSC to finance the purchase of the needed equipment. Strategies to Include the appropriate equipment into procurement documents and the constraints as well as various possible means of financing, including purchase/hire, will be examined.
- The project will be based in Cambodia, but will involve travel to both Vietnam and Laos as well.

[1] Reference: Veyera, Chhieu & Johnston, Dara, Labour Based Contractors Progress Survey, ILO Upstream Project, 2001. http://www.cnctp.info/library/22-RD-SEM-007a_LBAT-Progress-Survey-Eng.pdf

MAIN TASKS

- The main tasks of this project will be to:
- Identify appropriate equipment, and the performance of, the potential demand for, and the supply of the equipment.
- Review the situation of SSC, their capacities, experiences and constraints working in the rural road sub-sector with respect to purchasing and operating the appropriate equipment.
- Identify any constraints which will need to be tackled to ensure an effective availability, development and mainstreaming of the identified equipment types.
- Make recommendations for follow up initiatives needed to enable the SSC to obtain the identified equipment including dissemination and mainstreaming.
- Review the potential for towed graders, to be integrated into rural road programs.
- Review the potential for mobile stone crushers, to be integrated into rural road programs.
- Elaborate a project document follow on research work that is required.
- Disseminate the findings nationally, regionally and internationally.

The project activities will be organized into four modules. The modules will be:

Module 1 Survey;
Module 2 Towed Grader;
Module 3 Mobile Small Scale Stone Crushers;
Module 4 Dissemination and Mainstreaming.

3. Key Outputs

The key outputs of the project will be the following:

a. Four Modular Reports.
b. One Project Document elaborated for follow up work.
c. Five dissemination seminars.
d. Information packages for the SSC translated into their language.
e. Updating of ITC lectures.
f. Website posting of key reports.

4. Main Activities

The following activities will be carried out:

- **Module 1: Survey**

i) Identify appropriate equipment:
   a. Identify equipment necessary and appropriate[2] to support the various rural road technologies that are emerging from the SEACAP (ANNEX A).

ii) Estimate overall demand for the identified equipment:
   a. Review the existing and planned rural road network development and maintenance plans for Cambodia, Laos, and Vietnam.
   b. Relate the road development programs to the quantum of road surfacing that will be applied and the corresponding projected quantities of plant and equipment needed.

[2] The consultants will reference the recommendations in the MART Working Paper No. 5 on intermediate equipment.

iii) In the context of meeting the demand for road construction equipment, estimate existing regional supply[3] of the appropriate equipment within the target countries:
   a. Identify the existing manufacturers and suppliers of the appropriate equipment.
   b. Identify the models and costs of the available existing appropriate equipment types.
   c. For equipment not locally available identify common sources and practices for the importation of this equipment.
   d. Identify the barriers to importing this equipment for the local contractors.
   e. Identify those items of equipment that are not locally available and need to be imported from sources outside of the region. Investigate the feasibility of producing these items of equipment locally.

iv) Identify Small Scale Contractors that are working in the rural road sector in the target countries. These should at least include the SSC:
   a. Cambodia - Those trained by the ILO Upstream Project (ANNEX B).
   b. Vietnam - Those who have carried out work in the RT2 (ANNEX C).
   c. Interview these SSC to establish their current plant capacities and their views on what additional plant is needed for them to be competitive in the sector.
   d. Review the experiences of SSC of existing appropriate equipment items.

v) Performance of equipment. For the identified equipment, establish productivity norms, operational costs, and utilization rates. This information should be gathered from manufacturers, equipment suppliers as well as contractors.

vi) Financing of Equipment:
   a. Interview SSC to identify how capital equipment purchases are financed.
   b. Identify constraints faced by the SSC.
   c. Identify potential financial institutions and financial arrangements that may enable the SSC to acquire the necessary equipment.

vii) Identify any design, testing, production, market, training, awareness /demonstration or contracting framework constraints which will need to be tackled to ensure an effective availability, development and mainstreaming of the identified equipment types.

viii) Develop strategies for including the identified appropriate equipment to be specified in procurement documents for rural road works in the target countries.

ix) Make recommendations for follow up initiatives needed to enable the SSC to obtain the needed equipment including dissemination and mainstreaming.

Module 2: Towed Grader

Two kinds of towed graders have been used in Cambodia, an imported one from Africa known as the Zambia in the KfW/TRIP program and a second grader developed locally by DTW.

[3] Thailand and China may be included as potential sources of equipment.

x) Review the potential for towed graders, combined with labour techniques, and spot improvements to facilitate the construction and maintenance of rural roads. The review should take into consideration:
   a. Basic performance norms of the two graders;
   b. The cost effectiveness of these graders over other alternative strategies and options;
   c. Related commercial aspects for the ownership of the graders by private sector small scale contractors.

xi) Elaborate strategies to integrate the towed graders into the national rural road programs.

Module 3: Mobile Small-Scale Stone Crushers

Mobile stone crushers are not new to SE Asia. These machines are manufactured[4] and used in the sub-region. However, their potential application to improve surfacing gravels for rural roadworks in Cambodia, Laos and Vietnam has not been exploited in recent times. In particular the use of improved gravels for spot improvements of rural roads has not been investigated.

xii) Review the existing knowledge base for mobile small-scale crushers, which have potential to facilitate more efficient small enterprise rural road construction and maintenance.

xiii) Identify regional manufacturers, models and costs of existing crushers. Interview existing and potential users of this equipment to gain their views on the performance, the cost effectiveness and their ability to finance the procurement of the crushers.

xiv) Confirm the viability of mobile stone crushers in rural roadworks in Cambodia, Laos and Vietnam by an assessment of the potential market in terms of size and nature of the local and regional market both initially and in the long term.

xv) Identify any design, testing, production, market, training or contracting framework constraints that will need to be tackled to ensure effective availability, development and mainstreaming of the crushers.

xvi) Elaborate strategies to integrate the mobile crushers into the national rural road programs.

Module 4: Dissemination of Results

The consultant will carry out the following dissemination activities:

xvii) **Project Document**. Elaborate a project document for follow up activities for Modules 1-3. The document should indicate potential implementing partners and include provision for any equipment field trialling and demonstrating required.

[4] For example they are manufactured in Ninh Binh Province of Vietnam.

xviii) **Seminars.** In total, five seminars will be held to inform stakeholders of the outcome of the project.

a. In Cambodia at the ITC two seminars will be held with key individuals involved in Cambodian rural transport invited as well as ITC students.
   - An inception seminar will be held at the start of the project during which the inception report is presented.
   - At the completion of the project the findings and outcomes of the three modules, as well as the project document, will be presented at the ITC.

b. In Laos, Sri Lanka[5] and Vietnam seminars will be held with key stakeholders at the completion of the project presenting the project findings, outcomes and project document.

xx) **Information packages for the SSC**. The key findings and outcomes of the project will be synthesized into an information package for the distribution to the SSC. The package will be translated into Khmer, Laos and Vietnamese and will be sent to the SSC who cooperated with the project.

xxi) **ITC lectures.** The Development Engineering Course and the Rural Development Course at the ITC will be reviewed and edited to include as appropriate relevant findings from this project. The modular reports and the contractor package will be provided to the ITC for reference.

xxii) **Website Posting.** The consultant will ensure that the Modular Reports, the Information Package and the Project Document will be posted on the following websites: gTKP, CNCTP, Vietnam - MoT.

5. REPORTS

The consultant will produce the following reports:

a. **Inception Report.** An inception report will be prepared within one month of the start of the project.

b. **Monthly Progress Reports.** Brief monthly progress reports will be prepared indicating actual progress against planned progress. The reports will identify any problems and will recommend appropriate solutions.

c. **Module Reports**. A report will be prepared for each module. The report will document the outcome of the activities associated with the module.

d. **Terminal Report**. A draft terminal report shall be prepared at the completion of project activities.

6. MONITORING AND EVALUATION

- **Routine monitoring** of the project activities will be made by the DFID/SEACAP Manager. The consultant will report to the DFID/SEACAP Manager in Cambodia on a frequent and regular basis.

[5] The Lanka Forum for Rural Transport Development could possibly facilitate such a seminar.

- The consultant will be responsible for identifying and notifying DFID/SEACAP manage of any delays or problems in the process as early as possible and for recommending solutions.

Terminal Evaluation. The tripartite review will consist of representatives from the MRD & ITC, the Consultant, and DFID/SEACAP. The Draft Terminal Report will serve as the basis for the final tri-partite evaluation of the project. The draft terminal report will be submitted to the MRD, ITC and to DFID/SEACAP. The terminal review shall recount the outcomes and impacts of the project and should be forward looking. Lessons learned, weaknesses in project design and difficulties encountered should be recorded. Suggestions for future interventions and actions should be discussed. The review shall have duration of approximately three working days.

TOR will be drafted for the Tripartite review by DFID/SEACAP. After the tripartite review, the final terminal report should be submitted for clearance.

7. PARTNERSHIPS

The project will be carried out in cooperation with the MRD and the ITC. It is expected that ITC students will be provided an opportunity to participate in most of the project activities. This will need to be coordinated with the appropriate authorities at the ITC. The students will require a nominal allowance that should be budgeted in the financial proposal.

In Vietnam and Laos, the consultant is encouraged but not required to enter into cooperative arrangements with the local engineering Universities. Formal contact will be necessary with the appropriate authorities in these two countries.

In addition there are local enterprises and NGOs that may also be partnered with to carry out the project.

8. PROJECT FUNDING

The SEACAP central funds from DFID London will fund the consultant for his work. MRD Cambodia and ITC will be partners in this project and will provide in-kind support by providing office facilities to the consultant.

9. EXPERTISE REQUIRED

The consultancy team will be composed of a Team Leader / Senior Engineering Researcher, who will be assisted by an appropriate number of technical staff according to the strategy of the consultant. The team must be able to demonstrate proven expertise in;

a. Minimum of 15 years experience in carrying out similar development of low cost technology and poverty related work.
b. Minimum of 10 years experience in Cambodia, Laos and Vietnam road sectors.
c. Knowledge and experience with the SEACAP program and its outputs in the area of rural road surfacing technologies.
d. Knowledge of transport's role in development, including exclusions, poverty and livelihoods.
e. Knowledge of the development and production of equipment in developing countries.
f. Knowledge of the costing and marketing of products in developing countries.
g. Experience with Contractor training and development.

h. Ability to deliver clear concise reports to a tight timescale and present findings to a range of audiences as appropriate.

10. TIMEFRAME

The anticipated time frame to complete this project is **twelve months**. The consultant should provide a workplan programme detailing activities, outputs, inputs including staff and other resources needed to carry out this project.

ANNEX A Road Surfaces

1 Engineered Natural Surface
2 Soil Stabilisation
3 Natural Gravel / Laterite
4 Water Bound Macadam
5 Dry Bound Macadam
6 Crushed Stone Macadam
7 Hand Packed Stone
8 Telford Paving
9 Cobble Stones
10 Stone Setts or Pavé
11 Dressed Stone
12 Mortared Stone
13 Stone Chippings
14 Slurry Bound Macadam
15 Bituminous Sand Seal
16 Bituminous Chip Seal
17 Slurry Seal
18 Ottaseal
19 Penetration Macadam (Bitumen)
20 Pre-Mix Macadam (Bitumen)
21 Burnt Clay Brick
22 Concrete Brick
23 Un-reinforced Concrete
24 Steel Reinforced Concrete
25 Bamboo Reinforced Concrete
26 Geo-cell Paving
27 Stone Chipping Blinding

Type of Roadbase or Subbase *Application suitability depends on various factors.*

1 Soil Stabilisation
2 Natural Gravel / Laterite
3 Water Bound Macadam
4 Dry Bound Macadam
5 Crushed Stone Macadam
6 Hand Packed Stone
7 Telford Paving
8 Slurry Bound Macadam
9 Sand Aggregate
10 Armoured Laterite
11 Pulverised Fuel Ash

ANNEX B Cambodian Contractors

No.	Name of the Company	Address and Contact Number
1	Bin Boniboth	No. 140, Group 6, Krous Village, Svay Dangkum Commune, Siem Reap District, Siem Reap Province. Tel: 012 882 313
2	Bunnak Construction Co.,Ltd – BCC Co.	No. 3, St. 360, Sangkat Boeung Keng Kang I, Khan Chamcarmon, Phnom Penh. Tel: 015-838 073.
3	Bopha Angkor Remextran Construction Co., Ltd.	Phnom Penh. Tel: 012-888 813
4	Chao Ket Construction	No. 265, Sisowath Bolvd., Sangkat Phsar Kandal I, Khan Daun Penh, Phnom Penh. Tel: 012-851 815, 016 898 533.
5	Cambodian Community Development (CCD)	Siem Reap District, Siem Reap Province. Tel: 015-637 650
6	Khatt Sath Construction Co., Ltd	No. 93Eo, Street 105, Sangkat Boeung Keng Kang 3, Khan Chamcarmon, Phnom Penh, Cambodia. Tel: 012-842 254 Fax: 023-721 756
7	Meas Sovuthidy	No. 101, Street Sothearos, Sangkat Tonle Basak, Khan Chamcarmon. Tel: 015-837 699, 012 941 059
8	Minh Savath	Mondul III Village, Slarkram Commune, Siem Reap District, Siem Reap Province. Tel: 012 890 871
9	Nuon Kresna	No. 0030, Banteay Chas Village, Slarkram Commune, Siem Reap District, Siem Reap Province. Tel: 012-890 133
10	Nep Saman Construction Company.	#44Eo, St. 282, Sangkat Boeng Kang, Khan Chamcarmon, Phnom Penh. Tel: 011-871 563 & 011-872 136.
11	Outh Thy Construction and Road Co., Ltd	National Road 3, Phsar Tram Khnar, Chung Rok Commune, Kong Pisei District, Kampong Speu Province. Tel: 023-368 724, 012-835 036.
12	Reahou Engineering Co., Ltd.	No. 16Eo., Street 172, Sangkat Chey Chumneah, Khan Daun Penh, P. Penh. Tel: 012- 900 779.
13	Royal Mekong Construction & Development Pte. Ltd.	No. 81, Road 315, Boeung Kok 2, Toul Kok District, Phnom Penh. Tel: 012-818 733.
14	San Meng	No. 233Eo, Samdach Monereth, Sangkat Boeng Salang, Khan Toul Kork, Phnom Penh. Tel: 012-845 791, 012 876 712, 012 876 360.
15	Tep Kosal Civil Co., Ltd	No. 132, Street 134, Sangkat Veal Vong, Khan 7 Makara, Phnom Penh. Tel: 012-887 763, 012-899 937, 012 930 096
16	Veng Sreng	No. 311, Street 182, Khan Toul Kok, Phnom Penh. Tel: 016-820 364, 015 920 166, Fax: 023-366 254.
17	Tiv Navuth	Mondul I Village, Svay Dangkum Commune, Siem Reap District, Siem Reap Province. Tel: 012 630 724

18	Hong Houthly	House # 422, Group 20, Ancharh Village, Ocha Commune, Battambang District. Battambang Tel: 012 927020, 054 952145
19	Ngoun Vibol	House # 70, Group 24, 20 Usaphea Village, Svay Po, Battambang District, Battambang Province Tel: 012 914691,884758,884793
20	Hong Chhay	House # 621, Group 14, Romchek 4, Ratnak Commune, Dattambang District, Battambang Province Tel: 012 853842
21	Sor Kam	House # 99, Group 7, Banteay Neang Commune, Mongol Borey District., Banteay Meanchey Province Tel: 012 911 186
22	Tang Tai Kiang	House # 38, Group 20, Sophy Village, kampong S'vay Commune, Serey Sophan District, Banteay Meanchey Province Tel: 012 833241,833251

ANNEX C RT2 RRST II The list of contractors (Version 1 – February 2006)

Tuyen Quang

No	Contractor	Address	Director	Tel.
1	Hiep Phu and Trung Thanh Joint venture Limited Company	Village Che No8, Luong Vuong, Yen Son, Tuyen Quang	Pham Quang Hiep	027.872051
2	Toan Thang Limited Company	Phan Thiet sub-district, Tuyen Quang town	Nguyen Manh Toan	027 823061
3	Hung Thinh Limited Company	Dai Cuong commune, Ung Hoa, Ha Tay	Dao Duy Thinh	034 775174
4	Phuong Dong Limited Company	263 17/8 road, Phan Thiet sub-district t, Tuyen Quang town	Nguyen Quang Tien	027 822701
5	Hoang Long Limited company	31 Nguyen Trai, Tan Quang, Tuyen Quang town	Hoang Chau Long	027 879054
6	Thanh Nam Infrastructure technical development & construction investment Company	Vi Xuyen town, Vi Xuyen district, Ha Giang	Pham Van Thanh	019 826519

Ninh Binh

No	Contractor	Address	Director	Tel.
1	Hong Tien Limited Company	Mr. Chuyen house – Me town – Gia Vien Ninh Binh	Ta Quang Nhuan	030868093
2	Hoang Long Limited Construction Company	Truong Yen commune, Hoa Lu, Ninh Binh	Le Hoang Anh	030620072
3	Chinh Tam private construction company	My Lo, Ninh My, Hoa Lu, Ninh Binh	Trinh Viet Thap	030 622470
4	Phu Tho Limited Construction Company	68C, group 21, Bo Xuyen sub-district, Thai Binh city	Nguyen Vinh Hai	036.841.388
5	59 Construction Join Stock Company	58 Lang Ha, Dong Da, Ha Noi	Le Xuan Dong	04 7763826
6	Manh Dung Limited construction Company	98 Hai thuong Lan Ong, Ninh Binh town	Hoang Duc Tho	030 873808
7	Quyet Tien Limited Construction Company	Thuong Kiem commune, Kim Son, Ninh Binh	Phan Thanh Phan	0913391727
8	Van Thang Limited Construction Company	My Lo, Ninh My commune, Hoa Lu, Ninh Binh	Do Van Dan	0913370150
9	Phuc Thanh private construction company	25 Khanh Tan, Ninh Khanh, Ninh Binh town	Tran Thanh Liem	030 622131
10	Phu Vuong Limited Construction Company	151 Phong Son, Nam Binh, Ninh Binh	Pham manh Cuong	030 883099

Hung Yen

No	Contractor	Address	Director	Tel.
1	Phuong Mai Construction company	Minh Phuong commune, Tien Lu, Hung Yen	Pham Cong Tien	0321550387
2	Quang Hung construction company	Quang Hung, Phu Cu, Hung Yen	Nguyen Van Hong	0321854172
3	Minh Hoang Construction & Irrigation limited company	Pham Ngu Lao, An Thi town, Hung Yen	Nguyen Van Hoa	0321830242
4	Ngan Son Construction joint-stock	Trieu Khuc, Tan Trieu,	Nguyen Van	045520071

	Company	Thanh Tri, Ha Noi	Nga	
5	Thinh Hung Limited Company	Bui Thi Cuc, An Thi town, Hung Yen	Nguyen Trong Tu	0321830244

Ha Tinh

No	Contractor	Address	Director	Tel.
1	Bac A Commercial and construction Joint-stock company	13 village, Cam Quang, Cam Xuyen, Ha Tinh	Nguyen Van Thai	039.861317
2	Ha Tinh industrial development-construction and trading joint stock company	162 Ha Huy Tap, Ha Tinh town, HT	Le Duc Thang	039 855568
3	Tan An construction Joint-stock company	45 Phan Boi Chau, Vinh city, Nghe An	Hoang Dinh Hoa	038853874
4	Road construction joint stock company No1, Ha Tinh	117 Quang Trung road, Hong Linh town, HaTinh	Le Van Nhon	039 853324
5	Ha Tinh Road and Bridge construction Joint-stock company	Ha Huy Tap, Ha Tinh town	Nguyen Hong Quang (Vice Director)	039 885227

Quang Binh

No	Contractor	Address	Director	Tel.
1	Truong Thinh Limited Construction Company	50 Nguyen Huu Canh, Dong Hoi, Quang Binh	Vo Minh Hoai	052.820024
2	Truong Thinh Limited Construction Company	50 Nguyen Huu Canh, Dong Hoi, Quang Binh	Vo Minh Hoai	052.820024
3	Nam Ha & Thanh Dat construction limited company (Join venture)	QL1A, Loc Ninh, Dong Hoi, Quang Binh	Duong Minh Hien	052 822311
4	Nhat Le & Tuong Minh construction limited company (Join venture)	Ha Trung, Bao Ninh, Dong Hoi, Quang Binh	Nguyen Huu Tuy	0913018059 052842077

Gia Lai

No	Contractor	Address	Director	Tel.
1	Le Minh construction Company	270B Hung Vuong, Pleiku	Le Tan Minh	059 821743
2	Duc Minh limited Company	A7, Tra Da Industrial zone, Pleiku	Le The Ky	059 857717
3	Gia Lai construction transport joint stock company and Gia Lai irrigation joint stock company Joint venture	Hoi Phu sub-district, Pleiku	Lai Duc Loi	059 824755
4	Trong Nguyen Limited Company	Krongchro town, Krongchro district, Gia Lai	Bui Thi Tru	059 832425
5	Dong Hung construction Factory – Gia Lai	189 Le Dai Hanh, Pleiku	Do Manh Luyn	059 822995

Dak Lak

No	Contractor	Address	Director	Tel.
1	Dien An road & bridge Limited Company	113 Hung Vuong, Buon Ma Thuot city, DakLak	Dao Thanh Long	050 852824
2	Joinventure of Dai Thanh Construction Limited & Thanh Son Construction	175 Nguyen Cong Tru, Buon Ma Thuot, DakLak	Pham Duc Khoa	050 853454

	Limited			
3	Tay Nguyen Road & Bridge Construction Limited	84 Nguyen Van Cu, TP Buon Ma Thuot, DakLak	Nguyen Dinh Huan	050 865297
4	Long Bien Construction Limited Company	205 Dinh Tien Hoang, Buon Ma Thuot, DakLak	Vuong Dinh Moc	050 852241
5	Phu Xuan Construction Limited Company	126 Phan Chu Trinh, Buon Ma Thuot, DakLak	Hoang Van Lai	050 956862
6	Phuc Vinh Construction Limited Company	95 Le Thanh Ton, Buon Ma Thuot, DakLak	Nguyen Thuc De	050 951239
7	Hoa Binh Construction Limited Company	54 Tran Phu, Buon Ma Thuot, DakLak	Le Van Cuu	050 853694

Dak Nong

No	Contractor	Address	Director	Tel.
1	Joinventure of Tan Thanh Construction Limited company & DakLak constrution investment Company	82 Nguyen Chi Thanh, Buon Ma Thuot, DakLak	Bui Manh Thang	050 876120
2	Tay Nguyen road & bridge Construction Limited company	84 Nguyen Van Cu, Buon Ma Thuot, DakLak	Nguyen Dinh Huan	050 865297
3	Viet Duc road & bridge Construction Limited company	641 Le Duan, Buon Ma Thuot, DakLak	Nguyen Xuan Thuy	050 825321
4	DakLak joint-stock Construction company	25 Le Duan, Buon Ma Thuot, DakLak	Bui Gia The (Vice Director)	050 814420
5	Manh Men Construction Limited company	370 Hoang Dieu, Buon Ma Thuot, DakLak	Pham Phu Mot	050 854046

APPENDIX II

DFID

SEACAP 020: Enhancing the Use of Locally Made, Low-cost Equipment for the Road Sector

Summary Report on the De-briefing Seminar to Discuss SEACAP 020 Study Results/Outputs

Vientiane, Lao PDR (30 May, 2008)

Hanoi, Vietnam (03 June, 2008) and

Phnom Penh, Cambodia (06 June, 2008)

itt

TABLE OF CONTENTS

APPENDICES

EXECUTIVE SUMMARY

1. This is the summary report of the findings from the de-briefing seminars organised in three countries (Cambodia, Vietnam and Laos) to present the findings of the SEACAP 20 project, financed by the Department for International Development (DFID), UK under its South East Asia Community Access Programme (SEACAP), entitled "Enhancing the Use of Locally Made, Low Cost Equipment for the Road Sector". The main purpose of the seminar was three-fold: (i) to present the findings of SEACAP 020; (ii) to solicit views of the participants on the findings/outcomes; (iii) to assess what requires to be done to make low-cost equipment to the contractors in the region. The seminars also were a part of a SEACAP 020 dissemination strategy.

2. The overwhelming consensus from the seminar was that the study results/outputs reflected the situation with regard to the availability and accessibility of the equipment that is necessary and appropriate for the emerging rural road technologies from SEACAP projects in the region.

3. The seminars have highlighted a number of issues that the study has successfully identified including the difficulties of SSCs in Laos, findings linked to the mobile small scale crushers and financial issues linked to the SSCs in the region.

4. As per the seminar participants, the main issues that the study could not address was the use of Cong Nong (a makeshift haulage equipment) in the construction industry and the in-depth investigation of the issue linked to the bituminous equipment in Vietnam.

5. A seminar evaluation found that the participants were highly satisfied with the outcome of the seminar. The participants made no negative comments on the usefulness and organisation of the seminars. However, some participants felt that the total time allowed for discussions was too short.

1. INTRODUCTION

A series of a half day seminars was held in Lao PDR, Vietnam and Cambodia. The main aim of the seminars was to present the results and findings of the South-East Asia Community Access Programme (SEACAP) supported SEACAP 020 project. SEACAP is being implemented with financial assistance from the Department of International Development (DFID), UK. The Lao PDR, Vietnam and Cambodia seminars were held in Vientiane (30th May, 2008), Hanoi (3rd June, 2008) and Phnom Penh (6th June, 2008) respectively.

The Lao PDR seminar was formally opened by Mr Sengdarith Kattignasack, Director, Local Road Division, Ministry of CTPC. Director of R&D Management and International Relations, Institute of Transport Science and Technology (ITST), opened the Vietnam seminar. The final seminar in Phnom Penh was opened by HE Suos Kong, Secretary of State, Ministry of Rural Development, Royal Government of Cambodia.

In all three seminars, participants were involved in group work. Consultants involved in the project made presentations highlighting the study findings before the group work. That encouraged active contributions from the participants. The generic seminar programme is given in Annex 1.

A total of 28, 31 and 33 participants attended the Vientiane, Hanoi and Phnom Penh seminars respectively. The seminar participants included civil servants, representatives from the private sector, consultants and representatives from the media. A full list of the participants who attended the three seminars is given in Annex 2.

2. PURPOSE OF THE SEMINAR

The main purpose of the seminar was three-fold: (i) to present the findings of SEACAP 020; (ii) to solicit views of the participants on the findings/outcomes; (iii) to assess what requires to be done to make low-cost equipment available to the contractors in the region. The seminars were seen as one of the ways to disseminate the SEACAP 020 findings.

3. METHODOLOGY AND PROCEEDINGS

In all the seminars a total of four presentations were made by the Consultants. A brief clarification/question session followed the presentation. Then the participants were divided into two groups for group work. The groups were asked to work towards answering on the questions given below. Subsequently each group presented their findings.

Question 1

Do you think that the study results/outputs have truly reflected the situation in your own country?
If yes, what findings are most relevant in the country context?
If no, what issues the study has failed to address?

Question 2

How would you like the small scale construction industry, linked to the road sector, to look in the next 10 years?
What problems need to be overcome to achieve the vision?
How do you overcome them?

4. GROUP WORK OUTPUTS

The outputs of the group work are presented in Annex 3. The salient output features are summarised below:

- In all the three countries the general consensus was that the study results/outputs reflected the situation in their respective countries;
- The main findings relevant to the different countries identified by the participants were:
    - Laos: Difficulties of small-small scale contractors and the cost of equipment
    - Vietnam: identification of construction equipment, findings linked to the mobile small-scale stone crushers, financial issues linked to the SSCs
    - Cambodia: although the participants agreed with the study results, no issues that the participants found most relevant in the country context were identified.
- The issues the study failed to identify were:
    - Laos: the Laos participants could not identify any issues that the study failed to address.
    - Vietnam: the issue linked to the use of Cong Nong (a makeshift haulage equipment) in the construction industry. Also the participant felt that the study should have addressed the issue of bituminous equipment more in-depth.
    - Cambodia: Participants agreed that the study essentially addressed all the issues in Cambodia.

5. SEMINAR EVALUATION & CLOSING

After the presentation of groupworks the seminar discussed issues that arose from of the presentations. Finally the Consultant thanked the participants for attending the seminar. Only in the case of Laos Mr Sengdarith Kattignasack, Director, Local Road Division, formally closed the seminar by thanking the participants and the Consultants. The participants in two seminars (Vietnam and Cambodia) completed a evaluation form that was designed to test the usefulness and organisation of the seminars. The summary evaluation results are provided in Annex 3. The level of satisfaction among the participants appeared to be very high. 88% to 100% of participants fully agreed or agreed with the findings presented by the consultants. There were no negative comments on the usefulness and organisation of the seminars from any of the participants. However, some participants commented that the total time allowed for discussions was too short.

APPENDICES

Annex 1

GENERIC SEMINAR PROGRAMME

Date: May/June, 2008

8:30-8:50	Opening statement, Purpose of the meeting, Introduction to Participants
8:50-9:05	SEACAP 020 Background
9:05-9:30	Presentation on the Survey Module
09:30-09:45	Tea/Coffee Break
09:45-10:05	Presentation on Towed Grader Module
10:05-10:25	Presentation on Mobile Small-Scale Stone Crusher Module
10:25-10:35	Open discussion (clarification etc.)
10:35 –12:30	Group Discussion, presentation, concluding remarks etc.
12:15	Seminar closed

Annex 2

LIST OF PARTICIPANTS

Lao PDR

Sl no.	Name	Designation	Organisation
1	Mr Long	Engineer	Phimmason Construction.co
2	Mr Sonesay	Deputy Director	Road and Bridge Construction.Co
3	Mr Chanthavong	Director	Keophosy Construction.co
4	Mr Kiengkailath	Engineer	Titae am phone Construction.co
5	Mr Thongluang	Engineer	SVS Techno.co
6	Mr Kham pheuy	Site Manager	SVS Techno.co
7	Mr Phouangmala	Engineer	Bridge Periodic (Rural Road and Bridge. Co)
8	Mr Kham fong	Director	Khamfong Construction.co
9	Mr Khamlan	Director	SSPT Construction.co
10	Mr Noy	Engineer	Keomanivong Construction.co
11.	Mr Yung	Engineer	Insi Construction.co
12	Mr Soukthavy	Engineer	Vientiane RMU
13	Mr Sengdarith Katiyasack	Director	LRD/DoR
14	Mr Chanh Bouphalivanh	Director	RAD/DoR
15	Mr Khampaseuth	Engineer	LRD/DoR
16	Mr Nolasack	Deputy Director	LRD/DoR
17	Mr Vongthong	Engineer	LRD/DoR
18	Mr Malaikham	Engineer	LRD/DoR
19	Mr Khampasai	Engineer	LRD/DoR
20	Mr Somchit	Engineer	DPW&T Vientiane Capital
21	Mr Khanthala	Deputy Head	Road Office, DPW&T Bolikhamxay Province
22	Mr Sychanh	Engineer	DPW&T Vientiane Province
23	Mr Per--- Olof	TL--LSRST III-Mc	Sweroad
24	Mr Xayphone	Consultant	Lao Consulting Group
25	Mr Sisomphones	Consultant	TCTI
26	Mr David Salter	Program Manager	SEACAP
27	Mr Masam Abedin	Consultant	I T Transport Ltd
28	Mr F Ahmed	Consultant	I T Transport Ltd

Vietnam

Sl no.	Name	Designation	Organisation
1	Trinh Ngoc Huong	Director of Technical & Planning Dept.	Hung Thinh Limited Co.
2	Le Quang Hung	Director	Joint Stock Co. for Investment Consultant and International Construction
3	Phung Huu Thanh	Vice Director	Phuong Dong Limited Co.
4	Pham Cong Tien	Director	Phuong Mai Construction Co.
5	Nguyen Duy Huan		Phuong Mai Construction Co.
6	Nguyen Dinh Huan	Director	Hoang Vu Construction Limited Co.
7	Hoang Van Lai	Director	Phu Xuan Construction Limited Co.
8	Bui Duc Tue	Director	Tu Luc 1 Construction Co., Tai Tue Branch, Hatay
9	Phung Tri Thuan	Director	Construction Joint Stock Co.
10	Le Hien	Vice Director	Joint Stock Co. for Transport Construction Gia Lai
11.	Nguyen Vinh Hai	Director	Phu Tho Limited Co.
12	Bui Cao Duc	Director	Phuoc Duc Construction Joint Stock Co.
13	Pham Thi Dung	Vice Director	Quyet Tien Limited Co.
14	Luu Minh Tuong	Director	Minh Tuong Consultant and Construction Limited Co.
15	Nguyen Van Hong	Director	Quang Hung Construction Co.
16	Ha Anh Thai	Official	Gia Lai Provincial Department of Transport
17	Dinh Quang Xoa	Vice Director of PMU	PMU of Ninh Binh Provincial Department of Transport
18	Pham Van Trung	Director	Ha Tinh Provincial Department of Transport
19	Dang Gia Nai	General Director	ITST
20	Doan Minh Tam	Vice General Director	ITST
21	Tran Quoc Thang	Vice Director	Project Implementation Dept., PMU18
22	Nguyen Huu Tri	Director	Road Airport Dept., ITST
23	Ung Viet Trung	Director	Transport Infrastructure Development and Investment Consultancy Center (TIDDICC), ITST
24	Simon Done		SEACAP 27 – TRL
25	Le Duc Tho		Crown Agent
26	Pham Tuyet Giang		Crown Agent
27	Bach The Dung		TRL
28	Vu Hong Dung	Vice Director	Rural Road Dept, TDSI
29	Ng uyen Minh Duc	Director of Technical & Planning Dept.	Industrial Online Newspaper
30	Mr Masam Abedin	Consultant	I T Transport Ltd
31	Mr F Ahmed	Consultant	I T Transport Ltd

Cambodia

Sl no.	Name	Designation	Organisation
1	HE Suos Kong	Secretary of State	MRD
2	H.E Chan Darong	Director General	MRD
3	Mr. Ngoun Dara	Deputy Director	MRD
4	Mr. Ros Sar	PDRD-SRP	MRD
5	Mr. Leang Seng	PDRD, Kampong Chhnang	MRD
6	Mr. Sok VanOeun	PDRD, Battambang	MRD
7	Mr. Chin Ratha	PDRD, Phnom Penh	MRD
8	Mr. Leoung Chor		Loueng Chor Company
9	Mr. Sam Ton Leng	Member	Leang Chor Company
10	Mr. Tho Samen		Tho Samen Company
11.	Mr. Kuy Hour		Kuy Hour Construction
12	Mr. Chou Hai Seng		Chou Hai Seng
13	Mr. Phat Sophal	Director	Phat Sophal Company
14	Mr. Ros The	Director,	Ros The Company
15	Mr. Kin Kinann	Director,	Kin Kinann Company
16	Richard Pollen	General Manager,	DTW Cambodia
17	Veng Huor	Lecturer	ITC
18	Seang Chan Sopheak	Lecturer	ITC
19	Chea Dara	Lecturer	ITC
20	Mr. Van Kiet	Country Officer	KfW
21	Mr. Hir Samnang	National Infrastructure Advisor	NCDD
22	Mr. Tim Grayling	International Infrastructure Advisor	NCDD
23	David Salter	Manager, SEACAP	SEACAP/DFID
24	Chao Sopheak Phibal	IT Transport	Consultant
25	Jasper Cook	Manager	SEACAP019
26	Heng Kackada	Secretary	CNCTP
27	Ly Savuth		CNCTP
28	Ms. Khiev Merldey	Deputy Director,	MRD
29	Ms. Kong Visakha		MRD
30	Uy Sambath	Vice Cheif Office,	MRD
31	Chea Vises	Cameraman, TV/MRD	
32	Mr Masam Abedin	Consultant	I T Transport Ltd
33	Mr F Ahmed	Consultant	I T Transport Ltd

Annex 3

GROUP WORK REPORTING

LAO PDR

Questions	Group 1	Group 2
1a. Do you think that the study results/outputs have truly reflected the situation in your own country? 1b. If yes, what findings are most relevant in the country context? 1c. If no, what issues the study has failed to address?	• Yes. The study did address the small-scale construction industry and low-cost equipment issues in Laos. • We, in particular, agree with the proposal for an in-depth study on the small-scale construction industry in Laos. We also agree with the equipment identified for rural roads related roadworks in Laos.	• Like Group 1 we also agree with the findings.
2a. How would you like the small scale construction industry, linked to the road sector, to look in the next 10 years? 2b. What problems need to be overcome to achieve the vision? 2c. How do you overcome them?	• A well equipped and efficient small-scale road construction industry. • Training of small scale contractors. • Public sector procurement policy • Donors and public sector may help in training small-scale contractors • Public sector should take a policy of "positively discrimination" to help small-scale contractors till the industry gets matured.	• An efficient small-scale road construction industry • Procurement policy of the public sector discriminates against small-scale contractors. • Public sector organisation should package the contract in such a way that it suits the small-scale contactors

VIETNAM

Questions	Group 1	Group 2
1a. Do you think that the study results/outputs have truly reflected the situation in your own country? 1b. If yes, what findings are most relevant in the country context? 1c. If no, what issues the study has failed to address?	• Yes they did. • The most relevant outputs in Vietnamese context is the Mobile Small Scale Stone Crushers. • However, the study could analyse a low-cost equipment (*Cong Nong*, a makeshift haulage equipment) which has considerable importance in Vietnamese context.	• The study results reflected the situation in Vietnam • Relevant findings of the study: construction equipment, financial solution of SSCs and support from government to SSCs • Issues the study have failed to address: low-cost vehicle (Cong Nong); bituminous hand sprayers; and bituminous equipment (more explanation!)
2a. How would you like the small scale construction industry, linked to the road sector, to look in the next 10 years? 2b. What problems need to be overcome to achieve the vision? 2c. How do you overcome them?	• .More involved in road projects • Access to equipment and overall finance problems • Banks should offer easier credit; client should introduce equipment to contractors; information on equipment should be provided through the local contractor association	• No vision provided. • Overall finance, labour skills; corruption • Preferential bank lending rates; removal of un-even competition (private vs. public sector construction bodies), inflation control

CAMBODIA

Questions	Group 1	Group 2
1a. Do you think that the study results/outputs have truly reflected the situation in your own country? 1b. If yes, what findings are most relevant in the country context? 1c. If no, what issues the study has failed to address?	• Yes the findings reflected the situation in Cambodia. • The study should have studied the rollers in detail like the towed graders and mobile crushers. • Why not costs between MG & TG not compared? • Towed graders are not popular in Cambodia due to high maintenance costs and their low productivity • Mobile crushers are not in use as they have high maintenance costs (jaw replacement) and crushing stone into small pieces to feed into them are costly.	• Group members agreed that the all research module 1, 2 and 3 have reflected the true situation in Cambodia. • But group members also find that the research has not detailed the causes of the problem and how to mainstream. For example the research has found that most of Cambodian contractors are not aware of or posses any of crusher or towed-grader despite these equipments have demonstrate their potential and effectiveness in a numbers of countries such as Vietnam. Therefore a more detail strategy in regard to propose use of any new technology or equipments.
2a. How would you like the small scale construction industry, linked to the road sector, to look in the next 10 years? 2b. What problems need to be overcome to achieve the vision? 2c. How do you overcome them?	• Small contractors feel confident and see profitability • Encourage small industries to produce TGs and MCs • Enhance number of lease companies for MCs and TGs • Financial support (e.g. donor, govt.) • Legal framework and regulation for lease companies (some contractors don't pay after the use of equipment)	• Rural road construction technology is changing form unsealed to sealed road. this would require training and capacity building of MRD's staff and contractors who construct the roads • There should be a mechanism to disseminate useful information such as construction technology, new equipments, etc… • There should be a mechanism to promote or support or encourage contractor to possess any new appropriate equipment for road works • The contractor want financial support so that they can improve and expand their capacity. • The contractors wish the project management system improves so that they can easily claim monies.

Annex 4

Seminar Evaluation Summary

	Vietnam			Cambodia		
	Proportion agreed or full-agreed	**Proportion indifferent**	**Proportion strongly dis-agree or dis-agree**	**Proportion agreed or full-agreed**	**Proportion indifferent**	**Proportion strongly dis-agree or dis-agree**
1. The seminar lived upto my expectations	100%	0%	0%	90%	10%	0%
2. The seminar content was relevant in my country context	94%	6%	0%	100%	0	0%
3. The seminar achieved its stated objectives	100%	0%	0%	95%	5%	0%
4. I could adequately participate in the seminar	88%	12%	0%	86%	14%	0%
5. The presenters were well prepared	100%	0%	0%	100%	0%	0%
6. The quality of the presentation was good	100%	0%	0%	100%	0%	0%
7. The seminar venue & arrangements were good	88%	I2%	0%	100%	0%	0%

APPENDIX III

Summary Study Findings

Survey module

i. Equipment ownership among the contractors was found to be high. In general, Vietnamese contractors owned more equipment than Cambodian contractors. The contractors also hired in equipment. The main source of equipment hire was other contractors.

ii. Evidence suggests that there is an occasional surge in demand for certain equipment (mainly haulage, compaction and grading equipment). The potential demand linked to the rural road related roadworks for the conventional equipment (e.g. trucks and compaction equipment) is estimated to be substantial. The demand for tractor-towed based technology has been estimated to be moderate.

iii. In general there are no significant equipment supply constraints in Cambodia and Vietnam. The supply meets the demand. There exists a spatial aspect to supply constraint of relatively sophisticated equipment (e.g. motor graders) as they are only available for sale in large cities. No evidence is available that suggest a temporal aspect to supply constraint.

iv. Among the study countries only Vietnam has a substantial manufacturing potential. However, evidence suggests that Vietnam is facing stiff competition from Chinese manufacturers at the higher end of the market (e.g. motor graders) and there is evidence that suggest some manufacturers have ceased the production of some equipment as a result of this.

v. Contractors in the region do not import equipment directly; they usually depend on dedicated importers for equipment importation.

vi. The overwhelmingly main source of equipment finance by contractors is the private capital; only a small minority of them financed equipment purchase using formal credit. Only a few contractors reported having problems in obtaining formal credit. The main problem cited by the contractors in obtaining formal credit were the strict terms and conditions (e.g. high interest rate, large deposits etc.) linked to credit services.

vii. No evidence from Cambodia and Vietnam suggests that potential SSCs face problems in entering the rural road sub-sector market. However, there is a cause for concern in Laos as there is evidence to suggest that a unfavourable climate for existing small-scale contractors and for market entrants. It is advised that the Government of Laos eases some of the constraints facing SSCs.

Towed Grader Module

viii. Large and medium sized motor graders were widely available and used for roadworks in the region. Small motor graders (less than 120 HP) were rare. Only two types of towed grader were available (mainly in Cambodia): the CamGrader and the Simba. Most interviewed contractors, however, were unaware of towed graders. The contractors felt that the large motor graders (more than 180 HP) were not suitable for use on small rural roads. However, if made available, small motor graders among the most suitable equipment for grading rural roads.

ix. A cost-effectiveness analysis, that used empirical data in combination with a number of assumptions, suggests that the Cam Grader is the most cost-effective equipment for grading earth roads, whether purchased new or second hand, at low

utilisation rates (less than 2,000 hrs/year). The same analysis also suggests that at low utilisation rates and gravel roads, the small-motor grader is the most cost-effective if purchased new and the Simba grader if purchased second hand. At higher utilisation rates and if equipment is hired, the small grader is the most cost effective equipment.

x. The study estimated the potential demand of graders linked to the planned rural road development in the three countries. The number of graders that will be required per year to implement the planned roadworks in Cambodia and Laos is estimated to be low (each country will require less than 10 units of motor and towed graders). The grader demand is higher in Vietnam (over 90 motor graders and 200 towed graders will be required per year). There appears to be little difficulty amongst contractors in the region in hiring or acquiring tractors, which opens the possibility of the use of towed graders. Many contractors in Vietnam were interested in the possibility of purchasing a towed grader. However, the amount that they would be willing to pay appears to be significantly below the market price. Less than a third of contractors interviewed in Cambodia were interested in purchasing a towed grader. Analysis suggests that the existing stock of motor graders appears adequate to meet the likely future demand that will originate from the rural roads sub-sector in the next five years.

xi. The overall conclusion is that there may be only limited opportunities for marketing towed graders in the region, given the adequate availability of the grading equipment. Therefore, there is no cause for concern on the shortage of grading equipment, at least in the near future.

Small-Scale Mobile Stone Crusher Module

xii. Mobile crushers owned by the contractors in the region were of the jaw crusher variety. Given that they are lighter and have simple crushing mechanism.

xiii. Among the three viable alternative options (hand knapping, using a mobile crusher and purchasing from a commercial quarry), mobile crushers are found to be the most cost-effective. However, hand knapping is the best option in a case when the required volume of broken stone is low or if the construction site is remotely located. When the quality of required crushed material is high and/or there is a special technical requirement, purchasing from a commercial quarry may become the only option available to the contractor.

xiv. The current demand for mobile crushers is high in Vietnam but low in Cambodia and Laos. The potential demand for mobile crushers linked to the rural roads sub-sector in Cambodia and Laos (combined) is relatively low (approximately 200 units per year are estimated to be required over the next 5 years). The potential demand in Vietnam is high (roughly 2,200 units per year). This is due to the anticipated expansion of paved rural road network in Vietnam. Evidence suggests that currently there is no crushing equipment supply constraint in the region.

xv. Evidence suggests that many contractors are not aware of the usefulness of the mobile crushers (especially its cost effectiveness) in sourcing crushed stone. It is recommended that the details of the benefits offered by the mobile crushers be disseminated among contractors and equipment suppliers in the region by appropriate authorities to make them aware of their potential advantages. Currently no mobile crusher hire market exists in the study countries. An objective of this dissemination process should be to encourage equipment suppliers to make mobile crushers available for hire, particularly in Vietnam.

xvi. There is overwhelming evidence from the region that suggests that the market will be able to match the future demand with adequate supply of crushing equipment. Therefore, no intervention aimed at increasing supply is necessary, barring the dissemination of the usefulness of the mobile crushers in sourcing crushed stone among contractors.