

Project Evaluation Summary Sheet

Project Number and Title: 013/05VIE. <i>Cocoa Fermentation and Drying and Quality Assessment in Vietnam</i>		
Vietnamese Institution(s): Biotechnology R&D Institute, Can Tho University (CTU)		
Australian Partner Institution(s): Queensland Department of Primary Industries and Fisheries, Australia		
Date Approved: Feb. 2006	Date Commenced: Feb. 2006	Date Completed (Original): Feb. 2008 Date Completed (Revised): Dec. 2008
Project budget (A\$):	Total Cost 317,214	From: AusAID: 187,919 Vietnamese institution: 81,635 Australian institution: 47,660
Project Abstract (from Proposal):		
<p>The Government of Vietnam is focusing on high quality of Vietnamese cocoa and set a new goal of having 10,000 ha of producing cocoa by 2010, aiming specially Dak Lak province and the Mekong Delta, which is a priority region for CARD projects. Smallholder farmers will cultivate most of this area and it is well recognized that cocoa can be a strong driver of rural development. However, it is critical that Vietnam produces a high quality fermented cocoa with a high price differential that would give additional income for Vietnamese cocoa farmers. The best way to assure good quality attributes is to train the relevant Vietnamese scientists on assessment of cocoa quality attributes, fermentation and drying methodologies. The obvious choice for training are scientists of Vietnamese Cocoa Development team in Nong Lam University, scientists from the Can Tho University, located in Mekong delta and WASI, the official cocoa research institute, located in Dak Lak province. In proposed project smallholder methods of fermenting and solar drying of cocoa, developed in other countries, will to be tested and adjusted to the Vietnamese conditions and practical aspects of farmer adoption. These methods will be passed to small farmers through extension and other appropriate channels. In tandem with this, training of Vietnamese staff, in cocoa sensory and chemical analysis, at QDPI&F is to be conducted. This will be done in the aim of producing cocoa of desirable quality attributes, which can then be monitored at the participating Vietnamese institutes.</p>		
Specific objectives:		
<ol style="list-style-type: none"> 1. To build capacity of three selected Vietnamese Institutions to assess cocoa quality 2. To establish sensory laboratories, to train sensory panels and install software packages for analysis at all three participating institutions 3. Training on analytical aspects of cocoa quality in Australia-QDPI&F for one scientist from Can Tho University and from Nong Lam University due to their existing analytical capacity 4. To optimize fermentation practices for small farmers 5. To introduce solar drying technology to two selected Vietnamese institutions 6. To extend methodologies to small farmers 		
Reports Produced (Scheduled and completed Date):		
Milestone (MS) Description	Scheduled	Completed
MS 1: CARD Contract Signed	February 2006	February 2006
MS 2: Baseline Survey	September 2006	April 2007
MS 3: 1 st Six Monthly Report	August 2006	October 2006
MS 4: 2 nd Six Monthly Report	February 2007	February 2007
MS 5: Cocoa Quality Report	July 2007	October 2008
MS 6: 3 rd Six Monthly Report	August 2007	November 2007
MS 7: Research Papers/Technical Reports	September 2007	October 2008
MS 8: Competent Staff at Can Tho, NLU, WASI	November 2007	November 2008
MS 9: Validation of Smallholder Benefits	December 2007	September 2008
MS 10: Project Completion Report	April 2008	July 2009

Evaluation Team: 1. Ms. Le Thi Ha (Team Leader), FAVRI 2. Mr. Nguyen Van Ly, RCDC, NIAPP 3. Ms. Pham Thanh Thuy, Cooperative Department, MPI 4. Mr. Nguyen Ha Hue, CARD M&E Coordinator 5. Dr. Marlo Rankin, CARD Research Management Specialist		Date of Evaluation: September 8-11, 2009	Project Completion Impact Evaluation (PCIE)
Evaluation Summary	Score	Comments	
Relevance	4	<p>The project objectives were and still remain highly relevant to increasing quality and production of cocoa in Vietnam, particularly as Vietnam becomes an emerging cocoa producer. Given the master plan of the Vietnam Government to expand the areas under cocoa trees to 80,000ha by 2020 with an estimated output of 110,000 tonnes and export turnover of US\$100-120 million, this project is particularly relevant at this time along with other programs like the Success Alliance.</p> <p>The design of the project, which focused on the development of the technology (drying and fermentation) and testing at site and then in combination with training and information dissemination activities, is evaluated as a good approach to achieving project objectives. The fermentation technology is highly appreciated by local cocoa farmers and processors in project provinces, especially in Ben Tre province where cocoa production is large and concentrated. The fermentation technology could be further extended and value gained from the adoption of these methods because fermented cocoa products are preferred by the market and obtain a quality payment incentive.</p> <p>The spontaneous adoption of solar dryers by collectors and processors in Ben Tre province indicates that they are relevant to the needs of the industry; however the relevance of solar drier technology to cocoa growers in Dak Lak province is questionable. The fermentation practices appear to have a greater level of relevance and broader potential for adoption but again only to farmers who produce sufficient quantities to meet the recommendations for fermentation. The relevance of the farmer selection site at Can tho also seems questionable given that there is currently only one farmer growing cocoa in Can Tho and he produced insufficient quantities to meet the needs of the fermenting and drying experiments. Regarding to design of the logframe, for ease of evaluation, it would have been useful if outputs were more clear and concentrated and were clearly linked with objectives and activities.</p>	
Effectiveness	3.5	<p>The evaluation found that this project has satisfactorily achieved its objectives but some aspects could have been implemented in a more effective way. In relation to project reporting, almost all reports submitted did not follow CARD reporting guidelines and as a consequence had to be revised and delayed payment of milestones. Basically, project technologies have been developed successfully in the pilot areas particularly in Ben Tre Province. The technology seems to be most suitable for larger farmers/collectors rather than small processors as larger quantities are required to make it efficient. On this basis, it could be said that a major benefit of the project has been the contribution made towards developing community-based collectors and processors (i.e. supporting necessary agribusiness development for cocoa sector). With the introduction of the solar driers that reduce labour costs and increase processing capacity, community-based collectors can now purchase larger quantities of fresh cacao pods from farmers in their local area for processing and supply direct to large customers (e.g. Cargill) which will keep transaction costs down for both farmers and customers and ensure greater</p>	

		consistency of the quality of product supplied. The CARD project appeared to coordinate well with the SUCCESS Alliance Program which has helped to increase project effectiveness.
Efficiency	3.5	<p>The project team is considered to be successful in organizing and cooperating with relevant stakeholders during the implementation of the project however, it was identified that greater support could perhaps have been provided by NLU to WASI especially in the areas of cocoa sensory evaluation as WASI is at initial stages and NLU already has the expertise.</p> <p>In relation to the affordability of technology developed, a set of four fermentation boxes were initially constructed at a cost of VND 5M due to selection of high quality wood. Later, it was recommended that farmers could select lower quality woods to build the boxes to reduce the cost to about VND 1.5M. A solar driers with 4m² drying bed (to dry 200 kg of wet cocoa beans/time) was costed by the project at VND 12-15M. While the initial investment in solar driers is relatively high due to the use of some imported materials, for larger farmers and collectors, the cost of building a solar drier is not considered to be beyond their reach. However, most cocoa farmers in Ben Tre only have small cocoa growing areas, making it difficult to do fermentation and drying to meet customer quality requirements. In addition to this many farmers feel that they would not be able to predict when is the best time to sell processed products, so they would prefer to sell fresh pods to collectors/processors when the price is good to avoid the risk. During the PCIE mission the price for fresh pods was VND 3,500/kg, and for dried, fermented beans was 45,000-47,000/kg. Given that it takes 10-12 kg of fresh pods in order to get 1 kg of dried beans, it appears that the margin that processors make for selling dried beans has the potential to be relatively low given the risk they take associated with fermentation and solar drying and the cost of purchasing raw materials (i.e. Cost for 1kg dry seed 12 x 3500VND = 42 000, sale price 45 000VND therefore 3000VND/kg income minus labour costs of fermentation and drying). Therefore in order to make a reasonable profit, large quantities must be processed and the price of raw materials needs to remain within an affordable range. While the project findings have identified the potential for processors to generate good income as cocoa prices have continued to increase over the past two years (e.g. Dec 07 27000VND/kg; June 08 36-38000VND/kg; Sep 09 45-47000VND/kg), the cost of raw materials has also increased. Hence, investment in the solar driers will be more suitable for cocoa processors/collectors/farmers who collect cocoa pods from other farmers in addition to their own pods.</p> <p>According to the training activities for researchers from three selected institutions, significant funds could have been saved if NLU had taken a more proactive role in delivering some of the project training given their existing expertise in cocoa quality assessment prior to the project beginning. With the support of the Australian partner, training for WASI and CTU could have been conducted at NLU.</p>
Sustainability	4	<p>During the evaluation field work, the evaluation team found that many positive outcomes from the project are likely to be maintained, replicated or extended. The indicators identified included:</p> <ul style="list-style-type: none"> • Since the project completion, there have been two new farmers/processors in Ben Tre province to invest in establishing solar driers (larger ones) as well as fermentation boxes to support their processing activities. • Based on the principles of the solar dryer, CTU staff have extended this technology to establish three water distillers in CTU headquarter to produce clean water.

		<ul style="list-style-type: none"> • Based on the lessons learned from implementation of the project, some further modifications have been made by CTU to the solar dryers so that they can be used in the case of prolonged rain (e.g. drying by electric lights, coals or wood fire). These recommendations will be disseminated to organizations/individuals for application. • Solar dryer and fermentation technology will be included into another project in Ben Tre province for further evaluation of its reliability. • Farmers interviewed said that they highly appreciated the solar dryers and fermentation technologies. They believed that the technologies were more practical and profitable than traditional methods and could be scaled up/extended. The champion farmers selected by the CARD project are also involved in the Success Alliance farmer clubs and have experience with farmer-to-farmer extension. With these networks established, it is anticipated that dissemination of information from the CARD project should be fairly rapid. • Staff from CTU, NLU, WASI, Ben Tre Department of Science and Technology trained by the project has become resource persons for in – country training courses/workshops on cocoa quality. • The information on solar dryer and fermentation technologies is circulated through training workshops, exhibition and training MSc students and technicians from participating organizations (CTU, NLU, WASI, Ben Tre Department of Science and Technology).
Impact	3.5	<p>At this stage of project completion, the project can be considered to have had a significant impact on the direct project stakeholders and beneficiaries (i.e. farmers, processors/collectors, staff of CTU, WASI and NLU). Capacity at the institutional level in cocoa quality assessment has especially been developed for CTU and WASI. NLU was already familiar with many of the techniques therefore the project has been of less benefit to them. Despite being assigned by MARD as the main institute responsible for cocoa research, WASI is still at an early stage of experience with cocoa production and quality assessment and believe that they still require further training in certain aspects (e.g. sensory analysis) to improve the skill base of their staff. The CARD project has begun this process of capacity development and hopefully by working with NLU during the CARD project a strong relationship has been developed where WASI can now call on the experience of NLU for further training and support as required.</p> <p>Storage, fermentation and drying trials were undertaken by CTU, WASI and NLU and methodologies introduced to improve cocoa quality through the use of solar dryers and fermentation practices. Solar driers were found to allow farmers/collectors to process much larger quantities of cocoa beans with a reduction in time and labour inputs for drying. This has resulted in cost-savings for the recipients of the solar driers and increased income due to current high demand and high price for dried, fermented beans in the market (see above section on Efficiency). Recommendations regarding fermentation, as provided in the manual, will not decrease labour inputs but should result in an improvement in quality aspects of the cocoa. The anecdotal evidence from the PCIE mission indicates the potential for positive financial impact from the adoption of fermentation practices (e.g. farmers can receive a bonus payment per kg from Cargil when total amount of beans sold were assessed to be 95% fermented or above). The impact of fermentation technology on quality is high, but the evidence of adoption by farmers is less convincing. The fact that growers with small volumes prefer to sell green bean may be an issue.</p> <p>Positive social and environmental impacts were also observed by the evaluation</p>

		team. The selection of champion farmers has made the potential for farmer-to-farmer training much greater given their participation in existing cocoa extension activities and the environment impacts from growing cocoa can be considered to be neutral or mildly positive. Based on these initial positive impacts, it is anticipated that the project will have further impact on cocoa producers and processes in the future. The impact of the project could be re-evaluated in several years.
Average Score	3.7	Based on the evaluation team's findings, this project can be considered to have satisfactorily achieved its objectives and has demonstrated early signs of positive impact. There are also good indicators that project outputs will be sustained and extended. In relation to the relevance, effectiveness and efficiency of the project, the evaluation found that the project was successful when assessed against these factors. Project implementation and reporting (particularly in relation to the milestone deliverables) could have been of a higher standard and the had the opportunity to undertake a site visit prior to project proposal submission been taken the choice of sites for implementation could have been more relevant.
Overall Assessment b/: Satisfactory		
<p>Major Problems Identified: Some of the shortcomings of the project included issues such as:</p> <ul style="list-style-type: none"> • Delay in the submission of baseline survey due to low number of farmers growing cocoa in Can Tho therefore redirecting the survey towards Ben Tre • Insufficient cocoa grown in Can Tho meant that pods had to be collected from Ben Tre and transported to Can Tho in order for drying trials to be conducted • Distance from WASI to the cocoa growing areas in Dak Lak and the sensitive nature of these areas meant that Australian project staff were restricted from visiting the field sites and WASI staff could not get to these sites very often • Issues associated with the uptake of findings from Cocoa Manual – the cocoa manual took longer than expected to produce and there was not enough time left in the project to assess the impact of this manual on farmers in relation to the uptake of recommendations on fermentation and drying. • Given the experience in cocoa quality assessment at NLU, it seems that greater collaboration between the three VN institutes would have been of benefit. • In relation to the sensory training, in spite of follow-up training provided and the establishment of a sensory lab, WASI claimed that they did not feel confident to perform the sensory analysis. They mentioned that it took 2months to be trained in sensory analysis for coffee yet for cocoa they only received 2-days of training. They also found that the method for analysis that had been taught to them by the CARD project was different to that used by Cargill who are one of the major purchasers of cocoa in Dak Lak. • WASI also reported that the solar driers, even when used as hot houses, are not very practical for the central highlands. The scale is too small for effective drying and more research needs to be done to look at alternative ways to dry cocoa beans in this area. 		
<p>Lessons Learned:</p> <ul style="list-style-type: none"> • Need for regular dialogue among partners: Three Vietnamese institutions (CTU, NLU and WASI) and one Australian institution (Queensland Department of Primary Industries & Fisheries) were involved in this project as project partners. Each Vietnamese partner submitted project results directly to Australian institution. There was few discussion about project activities among Vietnamese institutions. Future projects should consider this. • The project has established relationships with the Department of Science and Technology in project provinces. These relationships were strong and close as many of the staff employed by these departments used to study at CTU or NLU and this resulted in full support at provincial level. However this project had a limited relationship with the Department of Agriculture and Rural 		

Development as well as with the Extension Center that plays an important role in delivering technologies to target farmers. This could be considered as one reason why technological transfer during this project has not been very strong.

Recommendations:

- CTU, NLU and WASI should develop more suitable modifications for solar dryers that can then be evaluated for their reliability.
- Findings from the fermentation trial demonstrated that cocoa quality will be better when it is fermented in larger quantities (50-250kg of wet cocoa beans/drying time depending on size) with suitable duration (i.e. 6 days). Therefore for cocoa processing, it is suggested that large farmers/cocoa collectors/processors collect more cocoa pods from other farmers to conduct fermentation and drying procedures. This approach is appropriate for the project solar dryers which require large amount of cocoa beans for each drying time.
- Fermentation recommendations should also be improved to be included in official national protocols of cocoa fermentation technology. It is suggested that NLU with their long history of cocoa research should be actively involved in this action in collaboration with international and national organizations (especially WASI).
- CTU should collaborate with Department of Science and Technology, Department of Agriculture and Rural Development, etc to simplify the content of cocoa processing training materials for smaller farmers with lower education levels.

a/ 1 = worst 5 = best

b/ Highly Satisfactory, Satisfactory, Moderately Satisfactory, Un-satisfactory