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Domestic and international market development for high value cattle and beef in SE Cambodia

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1 Progress summary

Project activities began in May 2012 with a project planning meeting with all project partners. This was followed by a more formal Inception Meeting and Market Chain Development Workshop hosted by DAPH on August 28th and 29th, 2012. These workshops set the scene and developed project management systems and workplans for Year 1.

The aim of the Project is to support the development of a market chain that encourages smallholder cattle producers in Cambodia to access the higher value markets of Ho Chi Minh City and Phnom Penh and improves on-farm biosecurity, thus reducing associated risks of disease. To achieve this, it is imperative that the Project is working with all cattle/beef market chain stakeholders. In Year 1, the Project has paid particular attention to consulting and including partners in all discussions and decisions. There has been significant interaction with farmers working closely with PDA partners. Initial farmer meetings have been held to explain the aims of the Project and the gauge potential interest of the farmers in being involved. Through a process of participatory diagnosis, 95 cattle owners (45 in Pursat and 50 in Kampong Cham) have been engaged as project partners. They have received initial training and assistance in planting forages and constructing cattle sheds. There has also been successful initial contact made with post-slaughter stakeholders including wholesalers and supermarkets. Linkages developed through previous ACIAR projects (particularly AH/2003/008 and AH/2006/025) have been further enhanced to maximise the potential for future cooperation.

Key activities in Year 1 have been:

- Establishment of project monitoring and communication systems (Activity 1.1). While it is an integrated project it has been decided to undertake activities within 3 components: Animal health and biosecurity (led by Jim Kerr), animal production and forage (Darryl Savage), marketing and economics (Ian Patrick). Each component has staff from all the partner organisations and takes responsibility for their particular activities. A project website has been established (<http://www.une.edu.au/irf/projects/i/i9.php>) which is a repository for all documents produced by the Project. There is also a Beef4Market Dropbox. A monthly reporting and trip report system has also been established to ensure effective communication between all partners.
- Development and application of the SES framework (Activity 1.2). The concept and rationale for adapting the social-ecological systems (SES) framework for analysis of livestock market chains was presented to project team members at the Phnom Penh project planning meeting over 28-29 May 2013. A preliminary version of the framework was presented, based on meeting discussions, to guide coding of literature relevant to the project. Progress in developing the market chain version of the framework was presented to the Market Chain Workshop held in Phnom Penh over 29-30 August 2013, at which valuable feedback on its development was obtained from invited experts and project team members. The framework has since been extended significantly to reflect differences between the original focus of the SES framework on managing natural resources and the focus of this project on management of all aspects of livestock market chains – beyond natural resources to all aspects of producing and marketing livestock. The extended framework is currently being finalised and documented for publication (Graham Marshall). A version of the framework was used as a checklist to ensure that all relevant variables were covered in the questionnaire designed for the household level survey in Kampong Cham and Pursat provinces.
- Completion of the household level survey in Kampong Cham and Pursat provinces (Activity 1.3). A total of 287 households were surveyed: 143 in Pursat and 144 in Kampong Cham. The respondents included both project farmers and non-project

farmers. The aim of the survey is identify the issues affecting a smallholder's ability or desire to produce fat cattle. Initial results were presented at the Annual Review meeting in April 2012.

- Preparation for planting of forage crops in partner communities and farms. Through an established process of participatory diagnosis, farmers in targeted villages of Kampong Cham and Pursat provinces were identified for participation in the project. For market chain and on-farm biosecurity interventions to be tested in Years 3 and 4 of this project, a network of farmers using forage-based cattle management systems, producing animals of higher condition scores (and therefore, higher market value), is necessary. Thus, activities in the animal production team for Year 1 have focussed on identifying suitable areas for establishing such cattle raising systems and engaging farmers that are willing to undertake the production of higher value animals. A significant time investment in training project staff, provincial department of agriculture staff and farmers, was undertaken in Year 1 of the project. Upskilling of these stakeholders is required to ensure the establishment of a higher value supply of cattle to the Phnom Penh and Ho Chi Minh cattle markets.
- Completion of consumer survey (Activity 1.5). Understanding the consumer demand for beef is regarded as critical in developing a market chain for improved quality beef into the urban supermarkets. In Cambodia the largest markets and the markets with the most potential are in Ho Chi Minh City and Phnom Penh. A survey of consumers was undertaken in January- February 2013 in Ho Chi Minh City and in March in Phnom Penh. 711 consumers in HCMC and 313 consumers in Phnom Penh in both traditional and supermarkets were asked to answer the questionnaire. Preliminary results indicate that in HCMC 92% of interviewed costumers are willing to pay more for 'Quality Certified Beef' .They are expected to pay 33% to 37% higher than the price they are currently paying for domestic beef. In Phnom Penh, 66% of interviewed costumers are willing to pay more for 'Quality Certified Beef'. They are expected to pay 7% to 10% higher than the price they are currently paying for domestic beef.
- Practices with a high risk of spreading livestock disease have been identified throughout the Cambodian cattle market chains. In the absence of regulatory disease control measures, the project is pursuing biosecurity education of market chain participants as a disease control intervention. Training booklets developed by ACIAR Project AH/2006/025 have been distributed to traders, livestock depot operators and village animal health workers during 2012-13. A draft biosecurity booklet for farmers was trialled early in 2013, and will be refined and joined by a matching digital story during 2013. Biosecurity protocols have also been developed for project staff to apply when visiting farmers, with a recommendation to the Cambodian DAHP that they be adopted for wider application in Cambodia by all departmental staff and other projects.

2 Achievements against activities and outputs/milestones

2.1 Achievements against project activities and outputs/milestones

Objective 1: Define and value the cattle market chain and identify the factors limiting smallholder participation in developing market opportunities

No.	Activity	Outputs/ milestones	Completion date	Comments
1.1	Manage partner and market chain stakeholder relationships	Opening workshop	Aug 2012	A project planning meeting was held for project partners to launch the project on May 28-29. Inception meeting held at DAPH on Aug 28. Market Chain planning workshop on Aug 29 and 30.
		Establish Project Liaison Group. 6 monthly meetings held, reports prepared	Delayed to May 2014	After discussion between project partners, it was decided to delay the formation of the group and change its focus. Instead of developing a 'liaison' group which often lacks purpose and influence it was decided to form a Market Chain Working Group at the end of Year 2. This would be made up of representatives at all levels of the market chain (farmer to supermarket) and have a clear purpose and mandate
		Final workshop	Dec 2015	
1.2	Construct framework for diagnosing/ analysing the cattle market chain, identify the knowledge gaps and stakeholder partners	Literature review undertaken. Development of a draft diagnostic framework and identification of knowledge gaps to be researched. Report presented	Sep 2012 Sep 2012	Literature review completed and entered on Project website and Dropbox. This is a living document which will be added to as the project proceeds. Draft diagnostic framework (checklist) constructed
		Series of activities (e.g. workshops, focus groups, interviews) with stakeholders to validate (and revise where necessary) (a) the draft diagnostic framework, (b) existing understandings of factors affecting performance of the cattle market chain, and (c) knowledge gaps to be researched.	May 2012 Aug 2012 Dec 2012 Apr 2013	Project partner workshop to discuss applicability of framework and appropriate headings Presentation at 'market chain' workshop and discussion with DAPH and RUA to validate the framework/checklist Use of checklist to influence the questions asked in the farm level survey Presentation of checklist with farm level survey example at Annual Review meeting
		Identification of specific project areas within Pursat and Kampong Cham Provinces.	Dec 2012 Apr 2013	Completed by DAPH and PDA Forage planting and farmer training begun

No.	Activity	Outputs/ milestones	Completion date	Comments
1.3	Design and implement base level survey. Provinces Kampong Cham, Pursat	Design of survey, with input from all stakeholders.	Dec 2012	First draft completed Consultation and partner input into survey design
		Survey form	Jan 2012	Form completed
		Train enumerators, supervisors, and data entry staff, who will implement the survey or data entry activities	Feb 2012	With RUA and managed by Socheat
		Pre-test the questionnaire in one location close to Phnom Penh. Revise and adapt the questionnaire based on the received feedback	Feb 2013	Completed 5 farmers in Prek Pour village, Prek Pour commune, Saang district, Kandal province
		Select survey participants and conduct survey	Feb 2013	Completed Pursat 143 households; Toul Krous 18, Or Tkov 30, Roleap 50, Kralanh 26, Doung 5, Toteng 1, Psar 7, Sre Resey 6 Kampong Cham 144 households; Kaoh Svay 36, Koh Ta Phem 11, Dei Kraham 48, Tuek Nuem 49
		Enter the data collected with the interviews into a database by trained data entry persons.	Mar 2013	Completed. This process was supervised by Socheat Sieng who constructed the dataset
		Dataset available to partners	Mar 2013	Completed. Dataset available in both Excel and SPSS formats
1.4	Describe market/value chain for transit and Cambodian bred cattle	Focus groups/key informant interviews to develop understanding of stakeholder relationships	Not yet due	Meetings with; 'Lucky' supermarket, Meat Wholesaler, Trader companies, Large traders, Small traders, Farmers
		Description of market/value chain of transit and Cambodian bred cattle	Not yet due	First draft completed (Aug 2012), meeting with traders, wholesalers and supermarkets. Field trip from Thai border to Vietnam border completed to meet stakeholders and develop understanding of cattle trade
1.5	Design and implement demand and consumer analysis. PP, HCMC	Consumer survey designed and completed, report presented at workshop	Dec 2012	Survey design and implemented in HCMC (717 respondents)
			Feb 2013	Survey implemented in PP (4 traditional – 203 respondents, and 4 super markets, 111 respondents)
			Mar 2013	Preliminary results presented at Annual Planning workshop
		Market demand data collection and modelling; present and future demand for Cambodian beef	Sept 2013 March 2014	

No.	Activity	Outputs/ milestones	Completion date	Comments
1.6	Design and implement risk assessment	Scope and design of risk assessment complete. Will include details on target sites (e.g. farms, villages, trader holdings, export depots, quarantine stations) and stakeholders (e.g. smallholders, traders, transporters, trading companies, officials.)	Not yet due	Networks have been established with farmers, traders, wholesalers, slaughterhouses and supermarkets
		Further assessment of the risk pathway and identification of the 'critical points' where risk reduction interventions will be most effective	Not yet due	ACIAR research suggests that farm- and village-level disease prevention is likely to rely heavily on vaccination. Vaccination failure has consequently been identified as a disease risk, prompting project research about the effectiveness of vaccination as it is currently managed/practised in Cambodia.
		Recommendations for practical biosecurity measures	Not yet due	A SOP for B4M project staff working on farms has been developed and made available to all staff
		Recommendations for practical biosecurity interventions post farm-gate (including village-level measures for VAHWs and traders, recommendations for transporters, depot operators, high-level traders, and officials in Cambodia & Vietnam).	Not yet due	Not yet due Biosecurity education has been identified as a practical intervention to attempt with market chain participants. Biosecurity booklets developed by ACIAR Project AH-2006/02 have been distributed to traders, livestock depot operators and VAHWs (2012-2013). A biosecurity education booklet for farmers was trialled in Pursat province in April 2013.
		Facilitation of biosecurity policy formulation	Not yet due	Policy advice and changes being passed on to Project HE Sen Sovann The biosecurity protocols developed for project staff have been recommended to the DAHP for wider application in Cambodia (i.e. by all projects and departmental staff).
		Workshop with policy makers re. future expectations	Not yet due	
1.7	Assessment of economics of improved cattle management and on-farm costs of disease	Economic analysis of improved cattle management practices	Not yet due	Spreadsheet drafted, not yet completed
		Socio-economic cost of disease on-farm identified	Not yet due	Not yet due

No.	Activity	Outputs/ milestones	Completion date	Comments
1.8	List potential on- and off-farm interventions that may improve stakeholder participation in the market chain and assess and refine the market chain diagnosis framework.	Mid-project review workshop, presentation of results from Activities 1.2 to 1.7 Diagnostic framework refined on basis of outputs from A1.3-A1.7.	Not yet due	Not yet due

Objective 2: Define and facilitate the adoption of market chain improvements/ interventions that assist small-scale cattle producers participate in the developing cattle markets

No.	Activity	Outputs/ milestones	Completion date	Comments
2.1	Test the potential interventions with regard to their private and public economic and social benefits and costs.	Summary of recommendations concerning benefits and costs of potential interventions	Not yet due	
		Select highest priority/payoff implementable interventions	Not yet due	
2.2	Facilitate the adoption of selected on-farm interventions	Implement and evaluate cattle productivity interventions	Not yet due	Partner farmers have been selected in the following villages: Pursat province: Toul Krous (17 farmers), Roleap (18), Kralanh (10) Kampong Cham Province: Kaoh Svay (15), Dei Kraham (19), Tek Tem (16) Pursat POAPH has begun training for farmers on how to build cattle sheds
		On-farm biosecurity improvements developed and tested	Not yet due	
2.3	Facilitate the development of a clean market chain where all stakeholders receive an economic benefit from producing and trading cattle into the developing markets	Market Chain Development Groups. Meetings held, activities agreed	Not yet due	
		Biosecurity interventions for post-farm sectors of the market chain developed and tested.	Not yet due	

No.	Activity	Outputs/ milestones	Completion date	Comments
		'Consumer-focussed' beef produced by smallholder farmers in SE Cambodia	Not yet due	Not yet due
		'Consumer-focussed' beef receiving a premium price in urban markets of Cambodia	Not yet due	Not yet due
2.4	Develop, with the assistance of other stakeholders, appropriate farmer, trader and livestock officer training packages and implement training programs in case-study locations.	Media, training and extension materials developed	Not yet due	Not yet due
		Qualified government and university staff capable of providing training	Not yet due	
		Training programs for farmers, village animal health workers, traders, retailers, project staff and university students developed. Stakeholders trained.	Not yet due	
2.5	Monitor and evaluate market chain interventions	Tested interventions and lessons learned completed	Not yet due	

2.2 Project contribution to the Australian aid program

As a result of your project in the reporting period:

1. Estimate approximately how many people gained access to and used improved agricultural technologies from your project?	The project has concentrated on developing networks and establishing partnerships in the first year of the project. There has been no adoption of technology yet
2. Estimate what percentage were women?	
3. Estimate the additional agricultural production in US dollars?	

4. What are the sources of your estimates?
5. During the project's activities, do you expect to contribute to the results outlined above? Please comment.

3 Impacts

3.1 Scientific impacts

Although the significance of the SES framework for structuring research into natural resource management issues is now widely recognised internationally, its potential for structuring research into livestock market chains (reliant on natural resources but also involving a range of production and marketing activities) is yet to be realised. Achieving this potential through the adaptations of the SES framework undertaken in this project, and applying the adapted framework to help design other research activities within the project, therefore represents a significant scientific contribution from the project.

Commenced development of an RUA/UNE-based research plan, building a program of undergraduate and postgraduate projects that will contribute to project activities. In the process of designing the research plan, opportunities related to tree-based and silage-based feeding systems for Cambodian small-holder farmers were investigated. A discussion paper related to a silage-based research program, integrating the NW project (ASEM/2010/049) was produced. (Activity 2.1)

3.2 Capacity impacts

Staff, particularly at RUA, have developed considerable experience in survey design, implementation and data entry. In total there were 4 RUA staff involved in assisting with design, 15 involved as enumerators (this included 2 days of training) and 4 for data entry and cleaning. This survey was managed by Mr Socheat Sieng and Mr Sok Muniroth who also developed their skills in survey management. 4 DAPH staff also had significant input into the survey design. Mr Lorn Sophal, who had been trained in a previous ACIAR project, was responsible for training PDA and RUA staff in Pursat and Kampong Cham in 'condition scoring' of cattle, 7 extra staff now have practical skills in condition scoring of cattle to Australian standards.

6 Project members from RUA and 3 from DAPH attended a five day training program "Experimental Design, Data Analysis and Interpretation in Livestock Research" in October 2012, funded by the Crawford Fund.

Two staff members have been enrolled in Postgraduate study programs sponsored by the Project at the Royal University of Agriculture in Phnom Penh. The topics are:

Mr Theng Kouch (PhD): Non-traditional approaches to improving cattle productivity, with specific reference to nitrogen cycling in the Cambodian smallholder context.

Ms Toch Sokunthea (Masters): The economic and environmental impacts of introducing forage into farming systems in Kampong Cham Province.

Mr Socheat Sieng is enrolled in a PhD at UNE, his topic is: An understanding of factors affecting, and strategies for improving cattle production and health in Cambodia.

Dr Nam Hoang and Mr Sok Muniroth worked with Mr Tai Lai and a group of students from University of Technology in HCMC, Vietnam to plan design and implement a consumer survey in Ho Chi Minh City. Both Dr. Nam Hoang Mr Sok Muniroth now have practical skills on consumer survey management.

Mr. Kong Reatrey (PDA, Pursat) led 25 RUA 3rd Year students to visit Beef4Market sites in Toul Krous village in Toul Krous commune Sampov Meas district. Students developed an understanding of the Project and discussed activities and potential benefits of improving cattle management.

3.3 Community impacts

3.3.1 Economic impacts

There are no direct economic benefits to project stakeholders as yet. Household survey data has been collected that will assist in developing an understanding of the economic benefits of a farming system which includes forage production. A Masters student

3.3.2 Social impacts

The Project has identified 95 farmers within the Provinces of Kampong Cham and Pursat. Within each province, farmers are represented across 3 communes (1 district within each commune). These farmers (in association with commune leaders and VAHWs) have been encouraged to meet together to talk about marketing, biosecurity and forage. It is important that the community take ownership of Project activities and work together as a group when negotiating with other market stakeholders. The household survey indicated that 89% of households in Kampong Cham and 82% in Pursat were keeping cattle for mainly nonproduction/economic reasons and only 3% actively weaned cattle.

Environmental impacts

There are no environmental impacts from the project in Year 1

3.4 Communication and dissemination activities

- A website has been established that will be a repository for all project information. This website also provides easy access to all partner websites and other important links including a blog which is an initiative of Pursat POAPH
<http://www.une.edu.au/irf/projects/i/i9.php>
- A Dropbox has been established so that all partners can move and edit documents as required. The Dropbox was established by Ian Patrick and is titled 'Beef4Market'
- Project summary pamphlet. Dr Sar Chetra (Project Leader, DAPH, Cambodia) has prepared a summary pamphlet in both English and Khmer which introduces the project to relevant stakeholders. This has been distributed as appropriate.
- 1400 and 480 biosecurity booklets for VAHWs and traders were distributed by the B4M project staff to the DAPH. The booklets will be used and distributed to stakeholders within the target provinces in the near future.
- 200 of these booklets were distributed to POAPH and depot operators in Kampong Cham and Pursat to improve the understanding and knowledge of stakeholders with regard to animal disease and biosecurity.
- T- shirts and caps. The DAPH has organised and presented Project T-shirts and caps to partner farmers in the 2 provinces.
- A biosecurity protocol for project staff when they visit farms and other project sites has been completed and is available in both English and Khmer.
- A draft of a simple biosecurity booklet for farmers has been developed in both English and Khmer and shared among project staff (DAHP and PoAHP).
- For simplicity the Project has adopted the title of Beef4Market (B4M). This will be used in all correspondence with the appropriate partner titles and logos. The following pictures are the logos to be used. They were selected through a competition open to all Project staff.



- B4M staff presented 5 papers at the 4th ICERD (International Conference on Environmental and Rural Development) in Siem Reap, January 20-21
- M. Pen, D. Savage, S. Lorn, and W. Stur, *Understanding the Beef Market Chain and Opportunities for Smallholder Farmers in Kampong Cham Province Cambodia*
- S. Lorn, S. Sorn, C. Sar, M. Pen and D. Savage, *Achieving adoption of improved practices by smallholder farmers – examples of methodologies from a successful livestock project*
- D. Savage, M. Pen, S. Lorn, *Value-Adding Cattle through Improved Management: A Case from Kampong Cham Province, Cambodia*
- J. Kerr, M. Anderson, P. Inthavong, K. Blaszak, A. Scoizec and S. Sieng, *Biosecurity education for livestock traders to reduce the spread of animal diseases in Laos and Cambodia*
- P. Ung, S. Lorn, S. Thim, K. Theng, S. Mam, and M. Seng, *Agricultural practice and constraints of ethnic minority in Saom Ka Ninh village, Cambodia*
- S. Toch, R. Por Reth, S. Povand V. Thun, *Economic Efficiency of Integrated Farming System and Rural Livelihood in Samrong District*
- P. Vong, N. Nan, K. Theng, M. Seng, *Social Economic of Small-scale Dairy Holder in Koh Krabey Village, Phnom Penh, Cambodia*
- S. Phon, M. Seng, E. Khoung, S.R. Ro, S. You, T. Tiermann, *Assessing the most suitable nitrogen application approach for maximum yield of Mulato II and minimal leaching (from F4B project work)*

4 Training activities

A summary of the training activities undertaken in the project are tabulated below. A further detailed description of critical capacity building activities with specific reference to the animal health aspects of the project are described in text below the table.

Timing	Training event	Location	People trained
May 2012	Forage-based cattle feeding systems	Tropeang Rong and Thmodar villages, Kampong Cham	Project staff (3 x Pursat PDA, 3 x Phnom Penh DAHP, 3 x RUA)
August 2012	Participatory Diagnosis – forages and cattle feeding systems	Dei Kraham Domknak Pongror and Ausang Ke villages, Kampong Cham Province	31 farmers from Kampong Cham province
September 2012	Participatory Diagnosis – forages and cattle feeding systems	Tuek Nuem, Kwet Touch and Hunn Chey villages, Kampong Cham Province	78 farmers from Kampong Cham province
October 2012	Marketing and selling of cattle	Toul Krous, Roleap, Pursat province	22 farmers
November 2012	Participatory Diagnosis – forages and cattle feeding systems	Toul Krous, Roleap and Kralanh villages, Pursat Province	62 farmers from Pursat province
December 2012	Farm level survey	Phnom Penh, Kampong Cham and Pursat	Enumerator training (students from RUA and staff of PDA)
January 2013	Farm level survey	Phnom Penh, Kampong Cham and Pursat	Enumerator training (students from RUA and staff of PDA)
January 2013	Consumer Survey	Ho Chi Minh City, Phnom Penh	Enumerator training (8 from University of Technology, HCMC and 9 from RUA)
February 2013	Forage establishment	Selected farms Kampong Cham Province	50 households
March 2013	Forage establishment	Selected farms Pursat Province	45 households

Within the animal health/biosecurity component of this project, a number of training activities have been undertaken.

- A literature review was conducted to assess existing training materials for possible use within this project.
- Biosecurity protocols were created for project staff to apply whenever visiting farmers in order to set an example and to ensure that we are not inadvertently responsible for spreading disease. *Note: These protocols have been recommended to the Cambodian DAHP for wider application in Cambodia (i.e. by other projects and departmental staff).*
- A meeting was held with the three large trading companies controlling Cambodia's cross-border trade in cattle and buffalo to demonstrate the biosecurity training booklets created specifically for livestock traders by ACIAR Project AH/2006/025. These booklets were offered to the companies for distribution to their agents.
- Visits were made to livestock depots adjacent the border with Thailand (import depot) and Vietnam (export depots) during which biosecurity protocols were discussed and training booklets distributed.
- Meetings were held with farmers in our Pursat province study areas to discuss their biosecurity training preferences and subsequently to trial educational booklets created specifically for Cambodian farmers.

Biosecurity training booklets created specifically for Village Animal Health Workers by ACIAR Project AH/2006/025 were provided to POAHP in our study provinces for distribution within our study areas.

5 Intellectual property

NA

6 Variations to future activities

The only change during the first 12 months are that some activities due to be started in Year 3 have been planned and will begin in Year 2. It was decided that if fat stock are to be available for sale in Years 3 and 4 it would be necessary to begin an intervention as soon as possible. It was decided that farmers who have elected to be part of the Project case study areas would be assisted in planting forage so that it could be used by farmers later in Year 2. This means that there are some activities under Objective 2 which have already begun.

7 Variations to personnel

Mr Jim Kerr, who is responsible for managing the animal health/biosecurity activities within the Project has reduced his input from 30% to 20% of his time. Mr Socheat Sieng has increased his input to compensate for this and provide greater support of this component. Socheat has begun a PhD at UNE on May 1st, 2013. Apart from the shift in salary from Jim to Socheat there are no budget implications for the Project. There are no transfers between partners of payment periods.

The following staff have been confirmed by the partners to be involved in the project:

Department of Animal Production and Health

- Dr. Sar Chetra, Project Leader
- Mr. Pich Peda, Project Coordinator and Technical Officer in Animal Health
- Mr. Khy Youkheng, Technical Officer in Animal Production
- Mr. Heng Morany, Technical Officer in Veterinary Public Health
- Mr. Kong Reatrey, Provincial Collaboration Officer in Pursat province
- Mr. Lorn Sophal, Provincial Collaboration Officer in Kampong Cham province
- Mr. Soum Sivithiea, Project Accounting Staff
- Mr. Bou Theoun, Project Administrative Staff

Assistance in Pursat province provided by: Mr. Mao Bopha Makara (Admin), Mr. Som Veun, Mr. Ros La and Mr. Sam Sy.

Royal University of Agriculture

- Prof Dr. Seng Mom, Vice Rector
- Mr. Theng Kouch, PhD student
- Mr. Ung Putheany, Research Assistant
- Ms. Toch Sokunthea, Master student
- Ms. Vong Pisey, Research Assistant
- Ms. Chheun Sreyneang, Research Assistant.

The passing of Dr Tim Purcell (Director, ADI) required a restructure of some Project responsibilities. Mr Sok Muniroth is now directly employed (under a contractor agreement with UNE) rather than through ADI. HE Sen Sovann has also been contracted to assist the Project with policy insights and advice, a role which was to be undertaken by Tim Purcell.

8 Problems and opportunities

Research by this project and its ACIAR predecessors has identified practices carried out by farmers, VAHWs and traders which carry a high risk of livestock disease transmission, especially during outbreaks of FMD. In addition to communal grazing and roadside tethering of livestock, neighbours and VAHWs appear to be responsible for spread of disease by moving from infected to clean households during disease outbreaks without having cleaned themselves or their stock-handling equipment.

When the mechanisms of disease spread were explained to farmer groups, they readily acknowledged the disease threat posed by visiting friends and neighbours with sick livestock. When simple farm- and village-level biosecurity interventions were canvassed with them, however, a number of farmers said that it would be very difficult to challenge normal village behaviour by refusing neighbours access to livestock during times of disease outbreak or challenging VAHWs or project staff to apply biosecurity precautions.

Vaccination will consequently assume greater importance as a biosecurity strategy in situations where entrenched societal behaviour will delay adoption of other biosecurity measures (such as excluding friends and neighbours from livestock pens during disease outbreaks). Unfortunately, ACIAR research during the 2010 Cambodian FMD outbreak (Sieng and Kerr, 2013) raised concerns about the effectiveness of FMD vaccination as it is presently applied in Cambodia.

It is therefore planned that this project will further investigate the management and effectiveness of FMD vaccine and vaccination in Cambodia in order to identify any weaknesses in the process. It is planned that this research will form part of the PhD studies being undertaken by Socheat Sieng, and will generate practical recommendations to improve the effectiveness of FMD vaccination in Cambodia.

9 Budget

Payments in Year 1 correspond to the contracted requirements. Payment 1 was from May 1st 2012 and payment 2 November 1.