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Final report

Small research and development activity

SRA

Identifying research priorities for development of the beef industry in Cambodia and Lao PDR with special reference to animal health interventions

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1 Acknowledgments

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2 Executive summary

Opportunities to address rural poverty by improving smallholder cattle health and production systems have emerged in Laos and Cambodia in recent years, due to the rapidly increasing demand for meat in south-east Asia. Adoption of forages technology for improved cattle and buffalo nutrition, particularly in northern Laos, offers enhanced returns from fattening through intensification of large ruminant production. This has led to major livestock development and extension projects commencing, aimed at improving smallholder returns from large ruminants. This is particularly the case in Laos, with the focus in Cambodia being initially on poultry and pigs but increasingly on cattle. It has been observed that these improved returns have led to smallholder farmers seeking additional interventions to improve and safeguard their increasing productivity through disease risk management. However disease and poor husbandry remain major constraints to expansion of large ruminant production and there is a need for research to examine solutions to many issues that need to be overcome to facilitate the development programs.

This research was proposed to better define disease and husbandry limitations in the large ruminant village production system and then implement a suite of 'best practice' interventions for testing in both countries. To support this research proposal, SRA AH/2006/077 was undertaken between August 2006 and February 2008, with the objectives:

1. Confirm that the key concepts and research issues including economic drivers and producer receptivity for enhancing large ruminant productivity are captured in the 'best practice' proposal.
2. Define the role for ACIAR within the suite of current projects occurring in each country and identify the key partners, personnel, preferred locations and budgeting details required to progress the proposal.

The SRA findings were used to strengthen the 'best practice' proposal for both countries, resulting in development of AH/2005/086 for Cambodia commencing in July 2007and AH/2006/159 for Laos, commencing in May 2008.

Activities to meet the SRA objective included workshops in Cambodia and Lao PDR in September and October 2006, accompanied by staff from CIE (Centre for International Economics), to define the economic drivers and establish a role for ACIAR research. It observed that fattening for the Vietnamese market is creating significant increases in returns to some Lao producers. This has resulted in increased demand for health and other interventions to improve production and protect increased investments, particularly with scaling out of forage technologies commencing. The role for ACIAR was seen as identifying and testing additional interventions that meet the increasing demand for risk management by producers as increasing adoption of improved nutrition for fattening and ultimately improved productivity ensures

The SRA also determined the capacity to deliver the project in both countries. The infrastructure through the Department of Animal Health & Production (DAHP) was considered appropriate in Cambodia, although improving nutrition will need to be a major focus of the project. Capacity for delivery in Laos through the Department of Livestock and Fisheries (DLF) is progressing now that a large ADB extension project has commenced. Additional support for the project through other agencies such as CIAT may be appropriate. The SRA also reviewed existing national animal health needs and what other agencies and current projects are doing. Opportunities to engage potential project participants from government and non-government beef industry stakeholders plus potential villager research co-operators in the research were identified.

Finally, in mid 2007, farmer attitude surveys were commissioned in both countries, collaborating with DAHP in Cambodia and the DLF in Lao PDR. The surveys involved 90 large ruminant holding smallholder households across 3 key provinces in each country. Information on production systems, attitudes of farmers and their perceptions of constraints to large ruminant production were established. Farmers were keen to apply interventions to improve their production and there was evidence that many were willing to invest in these. There was also a high level of interest at central, provincial and district levels in both countries in participating in an applied research program that addresses the key issues identified in meetings and workshops that is aimed at supporting the emerging 'beef' industry. The model of applied research as used in the former ACIAR Fasciola program in Cambodia was considered appropriate by both proposed in-country project leaders.

3 Introduction

This SRA was undertaken to assist development of the proposed project AH/2005/086: "Best practice cattle and buffalo health and husbandry systems for Cambodia and Lao PDR". It enabled workshops, field visits and farmer attitude surveys to be conducted over an extended period, resulting in identification of clearer determination of capacity constraints, better targeted project aims, identification of key collaborative partners and personnel, preferred study sites and budgeting details. Importantly, it led to the development of related but separate research projects for each country, commencing ten months apart, being AH/2005/086: "Best practice cattle health and husbandry, Kingdom of Cambodia" and AH/2006/159: "Best practice cattle and buffalo health and husbandry, Lao PDR". The key outputs were documentation of economic drivers for the cattle industry, smallholder farmer attitudes to large ruminant production and the project aims, plus identification of a role ACIAR applied research.

4 Economic drivers & producer receptivity

4.1 Economic drivers

The review of the economic environment facing the predominantly smallholder production system in the cattle/buffalo industry in Cambodia and Laos, identified several issues, including:

- the incentives for intensification and commercialisation of cattle production are uncertain due to the informal trade and variable demand for beef domestically and in the region
- the capacity constraints pervading agricultural research and support systems, particularly as extensive donor and NGO involvement in rural development in both countries, has stretched manpower
- despite falls in cattle prices in early 2007 due to FMD outbreaks and restricted animal movement, the current level of export of live cattle and buffalo mainly to Vietnam and potentially China, is creating substantial demand for better quality animals that appears sustainable in the medium term.

With few commercial producers in either country, the majority of large ruminant stock will continue to be sourced from subsistence smallholders, who largely hold cattle as a 'bank' for meeting financial crises. In Laos, large ruminants are generally managed extensively, with the focus in Cambodia on draft power for rice production and transport. Most producers lack the intensive cattle husbandry skills needed to meet growing market demands for fatter animals, although forage production and stall feeding for fattening is

now established in parts of northern Laos and forages are emerging in parts of Cambodia. Fattening for the Vietnamese market is creating significant increases in returns to some Lao producers, resulting in increased demand for other interventions to improve production and protect increased investments.

4.2 Producer receptivity

Farmer attitudes to interventions were surveyed in both countries involving 6 cattle/buffalo producing households being interviewed in 5 villages in each of 3 provinces, totalling 90 households in each country.

4.2.1 Laos

Smallholder farmers in the upland area in the Paek District of Xiengkhouang Province, the Pakseng District of Luang Prabang Province and the Huameuang District in Houaphan Province were surveyed. There were 136 participants representing 3 ethnic groups (65 Lao Loum, 21 Lao Theug and 6 Lao Seung households) with 75% of households having less than 2 hectares under cultivation. Three quarters of households indicated that large livestock contribute in excess of 50% of household income. Almost 44% of households had more than 10 cows with 12% having in excess of 10 cows. Almost 97% of households identified the main livestock use by the farmer was for sale and 13% identified agricultural work as also important. Cattle were the preferred livestock for purchase to increase their holding. Despite the higher average sale price per animal for buffalo (US$507.40) over cattle (US$309.40) that was indicated by the interviewees, the low birth-rate and relatively low price per kg for buffalo made them less desirable.

Production problems were rated in descending importance (according to % of respondents identifying an issue):

- health (85%)
- feed shortage (51%)
- social issues (eg. conflict, theft- 17.5%)
- other reasons (e.g. wildlife attacks, etc - 13%)
- market access (2%).

Management interventions by the farmer included provision of housing for the animal (stall feeding) by 87% of respondents and vaccination by 42.5%. There were low levels of farmer understanding of

- the role of vaccine (39%)
- parasite treatment (30%)
- assisting difficult calving (15%)
- supplementary feeding (30%).

This suggests that a significant knowledge gap exists on health prevention and treatment plus nutritional supplementation, despite the high rate of intensification.

The survey confirmed that large livestock are very important for many upland livelihoods in rural Lao PDR (contributing >half of yearly income for >70% of households), and that livestock health is considered very important (85% of households recognising poor health as a priority), despite 60% of farmers interviewed not being aware of vaccination as a disease control measure. Surprisingly, supplementary feeding and collection of manure was low in the surveyed area.

4.2.2 Cambodia

The survey was conducted in 90 households in 5 villages in each of the 3 provinces of Kandal, Kampong Cham and Takeo. Average cattle in each household in the three provinces were 5.11, 6.7 and 3.5 head respectively. More than half (56%) of responses indicated that cattle-raising occupied second place after rice cultivation, with vegetables of equal importance in Kandal province. Over 96% reported cattle as the most popular type of animal for raising, with their reasons for preference being draft (87%), sale (77%), breeding (77%), manure and as an asset for family heritage (100%).

The survey identified 6 constraints in cattle production in decreasing priority:

- diseases
- availability of funds
- technology deficits
- cattle breed
- feeding
- marketing.

The importance of disease and feed as constraints to cattle production was evident from high mortality and morbidity rates (17.5% sick and died) and 49% of interviewees confirming they had problems with cattle feed. Cattle breeding management was a major constraint with an absence of a breeding program in Takeo (87%) and Kampong Cham (67%) and cattle scavenging freely in the herd within the community and unsupervised ‘natural’ mating occurred. In contrast, the majority of farmers in Kandal selected a bull for servicing their cows.

Husbandry technology and funds for the investment in cattle-raising were additional constraints for most villagers. Over 60% indicated they had little knowledge of husbandry, health and disease control and 61% did not have funds to invest in a cattle husbandry program. Manure was very important for fertilizer for crops and vegetables (93% used cattle dung as fertilizer for rice paddy fields) although the level of cattle dung management is still low (72% stored dung in trenches but most of the trenches had no roof or fence to protect the dung from rain and sunlight, causing deterioration and loss of value as fertilizer). On average, each day, more than 4 hours were required for caring for cattle; either by keeping cattle at home (especially Kandal) and ‘cutting and carrying’ of grass for feeding or by taking the cattle into the fields for feeding.

5 The role for ACIAR research

The apparent success of the ADB and EU livestock projects in northern Laos indicates that where smallholders can access a market that demands fattened animals, the labour saving advantage of forages provides incentives for farmers to invest for higher returns. This in turn results in their seeking advice on health and risk management. Future ACIAR research has a role in identifying the interventions that can best meet this demand, working closely with larger development projects aimed at developing rural income security. Thus ACIAR should work in areas where access and proximity to export market exists and locally established forage production is already demonstrating a payoff from switching labour out of cropping into growing, cut and carrying forages, and feeding cattle. This complements the ‘bank’ function of cattle and buffalo and facilitating an increase in the value of the livestock assets.

The surveys of participants indicated that farmers were keen to apply interventions to improve their production and there was evidence that many were willing to invest in these. There was also a high level of interest at central, provincial and district levels in both countries in participating in an applied research program that addresses the key issues identified in meetings and workshops aimed at supporting the emerging 'beef' industry. The model of applied research as used in the former ACIAR Fasciola program in Cambodia was considered appropriate by both proposed in-country project leaders. The capacity to deliver the project through the DAHP was considered adequate in Cambodia, although improving nutrition will need to be a major focus of the project. Capacity for delivery in Laos through the DLF is progressing now that a large ADB extension project has commenced, although additional support for the project through other agencies such as CIAT may be appropriate. An opportunity in Cambodia but not readily apparent in Laos is the availability of PhD candidates from the Royal Academy of Cambodia to do targeted health and production projects within a larger project.

Types of interventions

Consideration of the many possible interventions to improve smallholder beef health and husbandry in both countries were:

- Nutritional basis of production - forage technology is necessary to provide a sound basis for expansion and intensification of production plus risk management.
- Animal health issues- the priorities are prevention of haemorrhagic septicaemia and foot and mouth disease and control of Toxocara (in buffalo calves) and Fasciola (in adults, mainly cattle, in some locations).
- Reproduction & husbandry - with the current minimal management of this part of the production cycle, significant opportunity to improve exists.
- Genetics -should not be a major priority until other components improved.
- Marketing issues - can probably be improved at the smallholder level by increased understanding of growth and targets but major advances require involvement of traders.

6 Impacts

The impact of this SRA on the large ruminant health and production services community in both countries was the identification for workshop and meeting participants, of what 'best practice' large ruminant health and production systems would look like at both the village and national levels. The SRA engaged the participants in developing the key research questions that would need to be addressed by projects. These included:

1. Does the use of forage to meet energy requirements needs to be established first?

Probably

2. Will routine HS and FMD vaccination & biosecurity knowledge remove mortality risk?

Likely

3. Will improved Toxocara and Fasciola diagnosis & control improve health & productivity?

Likely

4. Is there a role for restricted mating to adjust calving & lactation to match seasonally available energy requirements, leading to improved calving rates and inter-calving intervals?

Potentially

5. Does knowledge of male and female breeding soundness improve productivity & returns?

Likely

6. Does knowledge of growth rate, weight targets, pricing & marketing improve returns?

Potentially

7. Are the key interventions able to be evaluated within a systems context?

Expected

8. Which interventions are most able to be included in extension programs at the village level?

To be determined

The impact of this SRA on policy was the confirmation through the meetings, field visits and workshops, that the key concepts and research for enhancing large ruminant productivity were captured in the subsequent project proposals. This resulted in the strategy to split the original combined countries project into two separate projects with a 9-month delay in the 'start up' for Lao PDR to enable resolution of project capacity constraints. Project AH2005/086 in Cambodia was approved in June 2007, and AH2006/159 was approved fro commencement in May 2008. The SRA enabled the economic drivers for project development and definition of a role for ACIAR research on enhancing large ruminant production systems to be defined for each country.

7 Training and capacity building

At the workshops in both countries, several of the key questions asked and discussed in some of the break-out and conclusion sessions were instrumental in fostering support for the proposed project and developed capacity of the attendees. Key questions were:

1. Is an ACIAR applied research project supporting smallholder beef production needed?

Yes

2. Are forage inputs needed before other interventions can be progressed?

Probably

3. Is a focus on livestock health interventions appropriate?

Yes

4. Is detailed data collection to enable measurement of success and impact of the interventions on production parameters achievable?

Yes

5. Is there currently capacity to deliver these projects in both countries?

Cambodia, Yes
Laos, Probably but further work required to identify key project personnel.

As a result of the visits and workshops, modifications to the project AH/2005/086 objectives were:

Confirm that current knowledge of disease limitations to large ruminant production is accurate, achieved through the conduct of a longitudinal survey of disease occurrence in project sites in both countries.

Implement a small suite of 'best practice' animal health and husbandry interventions for enhancing large ruminant production, achieved through the conduct of a 3 year health and production survey in project sites in both countries.

Evaluate the cost effectiveness of the interventions, achieved through socioeconomic studies of the participants in the production system in both countries.

Further training and capacity needs are currently being addressed in both countries.

8 Conclusions and recommendations

This SRA confirmed through the meetings, field visits and workshops, that the key concepts and research for enhancing large ruminant productivity were captured in the subsequent project proposals. These findings have and will continue to be incorporated into project documentation, resulting in a strategy to split the original combined country project into two projects with a nine month delay in the 'start up' for Lao PDR to enable further examination of project capacity constraints. Project AH2005/086 in Cambodia commenced in July 2007 with a successful 2 day implementation workshop involving 66 participants. John Stratton, a veterinarian with DAFF, has enrolled as a PhD student at the University of Sydney and commenced in Cambodia in October 2007. The project team under Dr Suon Sothoeun has been established and project sites identified in Cambodia, with the 3year longitudinal survey commencing in March 2008. Luzia Rast, a veterinary epidemiologist of NSW Department of Primary Industries, has been recruited to the University of Sydney as the project officer, commencing in April 2008. Luke York, a final year animal science student at the University of Sydney has been tasked to review findings from the farmer attitude surveys for his 2008 Honours thesis. Project AH2006/159 will commence in May 2008 in Lao PDR, with preliminary arrangements for the project implementation workshop and site selection in progress under supervision of Dr Syseng Khounsey.

This SRA enabled the economic drivers for large ruminant production and farmer receptivity to project interventions to be established, enabling a more informed strategy for project development. It also defined a role for ACIAR research as assisting the definition of best practice interventions that can potentially be 'scaled out' through existing livestock development projects for enhancing large ruminant production systems in each country.

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