

IACCB Mid Term Evaluation

Introduction

1. This report summarises the key findings and recommendations of a mid-term review of the Indonesia Australia Commercial Cattle Breeding (IACCB) program. The review was conducted in July 2017 and involved site visits to 6 pilot sites and interviews with key stakeholders, business managers and the implementation team.
2. The IACCB commenced in February 2016 as a \$9 million three year program funded under the Indonesia- Australia Partnership on Food Security in the Red Meat and Cattle Sector. This project was designed to support the Government of Indonesia's (GoI) long term objective to build its domestic cattle population in an effort to meet a growing local demand for beef. Due to land constraints innovative approaches are required to expand cattle breeding in Indonesia to commercial levels.
3. The IAACB is piloting a range of breeding models and investment opportunities with private sector partners and small holder farmers to assess commercially sustainable approaches. Program partners co-invest in land, staff, infrastructure and other resources. The support provide by IACCB includes cattle, technical assistance, monitoring and evaluation, commercial viability assessment, and in some cases improving infrastructure. IACCB's responsibility is to provide sufficient support to each partner, tailored to their needs, so that their breeding system has a high probability of achieving sustainable commercial outcomes and the models can be promoted to the industry.
4. There are now 8 pilots being implemented:
 - a. Four pilots involving cattle integrated with palm oil plantations. Generally this involves cattle grazing and breeding under palm with additional feed supplementation. In some cases these involve semi-intensive approaches to maintain body weight.
 - b. Three small holder pilots involving different forms of cooperative arrangements
 - c. Breedlot and intensive grazing model on open pasture (IACCB only provides technical assistance)

Summary of Key Findings

General

5. The program is now performing well and as planned. It had a delayed start due to procurement issues and limited availability of suitable partners. Eight pilot projects have now been established covering the SSKA model and smallholder cooperative models. There was limited opportunity to pilot the silviculture model.
6. The program is on track for meeting its targets set for 2017 and works closely with each partner, ensuring a strong focus on cost effective feed supply and maintenance of herd condition, and strengthening monitoring and evaluation to ensure the program is able to evaluate commercial viability.
7. The program is starting to significantly improve its documentation for each project, with project briefs and financial projections established for each model.
8. Key Indonesian and Australian stakeholders consider the program more relevant now than when it commenced in February 2016. The Indonesian Government's short term strategy to lower the beef price through the importation of Indian buffalo meat (IBM), and its longer term strategy to import

breeders and grow the population through the one in five breeder import ratio, has put pressure on the cattle industry to remain commercially viable. There is now an urgent need to develop viable models for commercial cattle breeding in Indonesia. The program has the potential to offer a range of commercial solutions.

9. The commercial breeding model under palms (SISKA) is of high significance to the Partnership as a model to scale up to commercial levels to increase the cattle herd and investment in the industry. The small holder cooperative model is of relevance to DFAT and MoA for its potential social impact. Between the two models there are a range of variations that involve both commercial operations and surrounding small holder farmers which also deliver social benefits.
10. The smallholder program is very relevant to the Indonesian government. It has full policy support and they are the main focus of MoA development programs as the majority of beef cattle are under the smallholder system. The smallholders represent 66% of households raising beef cattle (compared to 29% for medium scale farmers and only 5% household for large scale enterprise).
11. All industry experts consulted acknowledged that commercial viability can only be fully assessed after the second calving interval. One cycle does not provide sufficient information for a proof of concept under the variable conditions within each of the projects. In this respect the program will only be able to demonstrate full commercial viability, with a high degree of confidence, by January 2020. This is 12 months after the program is due to finish.
12. Initial calculations of return on investment indicate a payback period of 6-8 years with an average internal rate of return around 20%¹ after this period, however, this is dependent on a wide range of external and internal factors that need to be understood.
13. Of particular importance will be support for the feed supply chain, particularly to access cheap agricultural waste as a nutritional feed source for cattle. Currently some companies sell their waste overseas at a cheaper price than buyers can get it locally. This is due to economies of scale.
14. The IACBB team is highly valued for its technical advice, and the industry expertise and experience demonstrated by the Team Leader has been widely acknowledged as critical to ensure risks to the program are anticipated and mitigated. The decision to appoint an experienced industry expert to implement the program has been positively recognized.
15. The program is now at a critical juncture following a lengthy period of partner selection, delivery of cattle, establishing basic infrastructure, building working relationships, and providing required support services. The next phase will require improved communication, monitoring and evaluation, targeted research and robust economic modeling. The project team is well advanced in this respect and is now producing customized financial projections and detailed project status reports. Progress reports have continued to improve as the program develops.
16. Communication and gender strategies are in place and will be fully implemented over the next reporting period.
17. There is a wealth of literature available on cattle under palm plantations, as well as approaches to small holder cattle farming using cooperative approaches.
18. Many key partners in government and industry have requested more information on financial projections and descriptions of the various emerging commercial business models (including descriptions of supply chains and markets) in order to build support within the industry. All financial models should also include high, medium and low projections based on likely possible scenarios (e.g. pregnancy rates lower than expected for the second pregnancy).

¹ Devendra (2011) estimated an IRR of 19%.

19. The pilot projects are demonstrating a number of positive social impacts. The interaction between the cattle industry and local communities is an important factor in the success of most of the projects. Local communities are involved in many aspects of the supply chain (feed, organic fertilizer, integrated farming, biogas, and local services) but the different social structures need to be better understood to ensure they can benefit from the increase in economic activity. In some cases there are intermediaries between the small holder farmers and larger commercial operations.
20. The program is implementing a gender strategy and has assessed all projects through a gender and social inclusion lens. Gender and social inclusion analysis remains a challenge for the project. Further work could be done through specific case studies to understand the roles of men and women, and the challenges for women leaders in the local industry.

Specific findings on SSKA Models

Implementation

21. The initial lack of suitable partners for the program does not auger well for the ability to achieve scale up. It is known, however, that many industry players are currently waiting to see the results of the pilot programs before committing.
22. It is notable that in nearly all cases of cattle under palm the body condition of Australian cattle dropped soon after arrival. This may have been due to stress, climatic conditions and a different food source. All cattle needed to be given additional feed and nutrients. A key determinant of commercial success will be the ability to provide a cheap and nutritional supplementary food source in addition to the forage under palm. A lesson learnt is that more technical support is needed to be provided in the first few months to avoid this decline. This has set back at least one program by 2-3 months while the cattle recover.
23. The cattle management and palm operations manager appear to work closely together in all locations. The cattle breeding operation will require the ongoing support of the plantation owner. Without this support and some flexibility to accommodate pasture improvement and other facilities, such as a nursery, the operation is unlikely to succeed.
24. It is evident that there are significant net benefits to the palm plantation from cattle grazing. Cattle breeding under palm should be structured as an integrated business model to ensure the risks and benefits are shared.

Commercial Viability

25. There is an expectation that successful implementation will depend on being able to implement low cost feeding and management. During the early stages many pilot programs are finding that they need to invest more in infrastructure and supplementary feeding and nutrients than anticipated.
26. This need to provide additional feed is being addressed through pasture improvement trials that are yet to be scaled up. Pasture improvement needs to be tested under low light conditions and with grazing pressure. There is currently uncertainty as to how successful this is likely to be; however, the initial establishment costs are likely to be high (labour and propagation).
27. Pasture could be improved alongside roads and in open spaces to improve the feed source for cattle. This will improve available pasture which is quite sparse under many palms but abundant where there is good light. However, this may be a nuisance to planters and fruit pickers.

28. The location, spatial arrangement and topography plays an important role in contributing to commercial outcomes. Each palm plantation should be carefully mapped in terms of age of palm, road access and open space, as well as topography and natural barriers to cattle movement (e.g. rivers and gullies). This can be used to optimize the location of cattle and rotations. It is evident that those areas with undulating terrain make cattle management more difficult.
29. The literature makes claims about a range benefits to palm plantations from cattle grazing including 15% improvement in fruit bunches by weight, reduction in weed management and herbicide, and improved ecosystem services and biodiversity. These need to be validated for the pilot programs through proper research to support future investment, particular by plantation owners. For instance simultaneous trials with and without cattle. Fruit production varies year to year due to factors such as age of palms and climate.
30. Many pilot sites are significant distances from market. This will affect the price the business is able to get for cattle and the price of inputs such as feed supplements. The local markets may be insufficient to absorb all the potential supply from large scale operations and inefficient inter-island shipping will reduce the profitability. These need to be factored into projections of returns on investment.
31. The most cost-effective solution to provide feed to supplement the pasture involves vertical integration of the feed supply chain. This requires the plantation owner to have access to processing facilities. Byproducts from processing the palm fruit is a cheap and available supplement for the cattle. Palm kernel cake (PKC) provides protein and the fronds provide carbohydrate. However, palm fronds should not contribute more than 30-40% of the cattle diet. Similarly, cattle operations in Lampung have better access to agricultural waste products than those in Kalimantan.
32. There are several variations of the business model for cattle under palm. They range from grazing rotations (on a daily basis by moving the electric fence in 30-hectare plots and providing daily supplements) to breedlot-feedlot-grazing variations depending on the set up. It is likely that the pilot projects will offer information that can be applied to a range of different business models.
33. There is a perception that cattle spread disease, specifically the bracket fungi *Ganoderma boninense* which can kill palms in 2-3 years through infection through open wounds in the stem. In some areas it is reported that this disease can affect up to 40% of a plantation and is thought to have annual economic impact of up to \$500 million across the region. However, there is no evidence that cattle are a significant vector, given it can spread through airborne spores, insects, as well as soil.

Social Impacts

34. The combined cattle and palm operations provide additional economic benefit to the local community. The palm plantation typically employs 1000-2000 workers with equal numbers of males and females assigned to specific tasks related to harvesting and processing. The cattle business employs far fewer workers but provides some opportunities for skilled workers and managers. There is a shortage of skilled Australian cattle managers.
35. The economic benefits to surrounding villages can be significant by providing supporting goods and services – e.g restaurants, shops, vehicle repairs and maintenance, banking, health care and education.
36. The SISK operation can also help smallholders by providing some access to grazing under palms and training farmers how to manage Australian cattle.

37. The plantation can lose up to 2% of fruit to theft. There are similar concerns around cattle being stolen. In some cases, the cattle require 24 hour surveillance while under palm. Many plantation owners are also concerned that pasture improvement programs might be exploited by the surrounding small holders.

Specific findings on Smallholder Cooperative Models

Implementation

38. Small holder projects can attract a range of decision makers who can influence the project at different times making a proof of concept approach problematic for IACCB. Dinas Peternakan has the mandate to provide services but other institutions such as University researchers and Department of Cooperatives and Banks also provide inputs and services depending on their interests. The decision-making process is therefore challenging and confusing for the smallholders trying to manage the cattle. For IACCB funded projects there needs to be an agreement that IACCB provide coordination of all institutions involved to enable participatory decision making and to synergize support.
39. The smallholder project has the ability to influence government to provide support – e.g. improved road infrastructure and equipment. This is particularly true of early adopters who are able to showcase gains to government. For the SPR model the Bupati immediately invested in improving the road to the site after a visit to the community.
40. Preparation is required prior to project implementation to maximize the chances of success. This includes setting up infrastructure, feed bank, governance structure, managing community expectations, and understanding the role of stakeholders.
41. The local community places social and cultural value on raising cattle. It is not usually motivated by profit but simply the ability to cash in livestock when money is needed.

Commercial viability

42. Participation of farmers declined when they realize that they do not have enough time to manage the IACCB cattle and financial returns will not be achieved for several years. They also cannot afford to lose their opportunity to generate income from other activities. This was more evident with the SPR arrangement.
43. Some farmers in the smallholder program do not consider cattle breeding a commercial activity. Own inputs (feeds, labour) are sometimes not calculated as costs. The program will only benefit group members who have the resources (such as land to plant forages) and willing to invest in time and effort will reap the benefit. They are often required to forego opportunities to undertake casual labour for cash in order to look after the cattle.
44. The ability of the farmers to provide high quality feeds at acceptable costs to achieve high cattle productivity will determine the commercial viability. They are more resilient to changes and have low opportunity costs than the large companies, therefore they have the ability to accept much lower profit margins.
45. A greater effort and synergy from all stakeholders are needed to facilitate farmers to improve cattle productivity. Technical feasibility of the system will attract funding and investment support.

Social Impacts

46. Women are able to participate by managing family cattle at home while they perform other family duties. This helps the men to focus on managing IACCB cattle in the collective pens.
47. One reason why some cooperatives end up distributing cattle to individual families rather than in a central location is to enable their wives to look after the cattle at home while they perform other casual labour to earn a cash income.
48. The program only benefits part of the community. However, it benefits other actors (feed suppliers, middle men and cattle traders) and provides income generating opportunities to the community (biogas, fertilizer, horticulture production). A legal mechanism is needed to expand the program to other farmer groups from a core investment site – e.g. the progeny are distributed to replicate the model with nearby farmer groups and training is provided by the initial group. The model then continues to expand under the same arrangements.

Recommendations

49. Communication with the Project Board needs to improve. The use of teleconferencing (usually separate calls to different partners) has limited the ability of the Board to fully interact and discuss issues. Face to face meetings at least once a year, (and preferably a site visit within the next 12 months with selected projects) with all members, would improve interaction and understanding of the key issues and potential of the program.
50. To maximize the current investment in the program and robustly determine the commercial viability of all models, the program will need a 12-month extension (ending January 2020) with a gradual phase out of technical support and an investment in research and economic modelling through short term technical advisers. A research scientist and economic modeler will be required to write up each of the pilot projects using a robust and defensible methodology. A communications specialist will be required to translate these reports into a prospectus for future investment if they prove successful.
51. There is a need to better understand the scale-up potential of the local industry and the type of information industry needs to make an informed decision. There are about 10 million hectares of palm oil plantation with 42% managed by small holders, 52% commercial operations and 7% state owned enterprises. Within the 52% of privately owned commercial operations there are significant numbers of foreign owned entities. The appetite for grazing cattle under palm is unknown within each of these groups.
52. A comprehensive approach to cost benefit analysis, based on the literature review and consultation with project partners, should be developed for the commercial viability assessment. This should include tangible and intangible benefits, including social and cultural impact. Calculations of return on investment should be based on net present value (NPV) using the current discount rate (about 14%) and capital gains (land value). Projections should be based on high, medium and low performance scenarios so investors understand the risk profile and take into account location and market access. A comparison should also be made between using local or imported cattle, or possibly a mix.
53. It would be timely to involve a representative from the Indonesian Agency for Agricultural Research and Development (IAARD), Ministry of Agriculture, on the Project Board. Given the emphasis of the next phase of the program it could provide advice and lessons from other initiatives, as well as another communication channel to the MoA in order to build stronger advocacy for the program.

54. There is a need to better understand the different community models and interaction with commercial operations. There is an opportunity for surrounding farmers (the “plasma”) to work with the commercial plantation company (the “nucleus”) in supporting cattle breeding as well as supplying palm fruit for processing. There are also other models involving commercial feedlots and breedlots working with farmer cooperatives. Each have advantages and disadvantages that need to be understood. Increasing the cattle population in Indonesia will rely on a range of models covering the spectrum from smallholder farmers to large commercial cattle operations.
55. The ongoing focus on pasture improvement should be supported, including extensive trials to scale up under palms. Pastoral improvement may be a critical success factor in terms of commercial viability. A literature review on previous trials might reveal what works and what doesn’t.
56. There is a need to increase the number of skilled workers who can handle the initial intake of Australian cattle to a plantation, assuming the program will scale up. One option is to offer internships to NTCA Pastoral Program graduates where Siska models are developing. These graduates have the basic skills that could be further developed through placements and would be available should the industry expand. It also offers them a career path in the industry.
57. An integrated business model should be developed for Siska and its variants. There are costs and benefits to the cattle and palms under the integrated arrangement that should be calculated together to reflect the level of dependency. For smallholder cooperatives a business model should be developed on sound financial principles in the first instance, calculating all inputs and using paid employment. Subsidized costs such as central pens, equipment and maintenance should be also calculated. Mechanisms should also be established for replication of the model to other farmer groups as a condition of receiving an initial supply of cattle (either from the government or another donor).
58. The program needs to ensure there is consistency in reporting across all pilot programs. While costs are typically monitored and recorded, there appears to be some inconsistency in the recording of some KPIs such as body condition scores, mating techniques and pregnancy testing. There is also a need to review the costs being recorded by each pilot project to ensure all costs are accounted for. This is required to be able to adequately compare models.
59. The Monitoring and Evaluation System should be updated within the next reporting period to reflect the priorities of the next phase of the program and include a research agenda; and support for economic modelling, commercial viability assessments and policy analysis. This is to ensure all data collection and analytical tasks are coordinated within a single plan and clearly link to the communication strategy and progress reporting.
60. It would be useful if a literature review was conducted within the next 6 months to extract lessons learnt and to support the commercial viability assessments. This should include research into the benefits to palm oil production and other social and environmental factors. There is also an opportunity to review the range of existing projects being conducted in Indonesia (private sector, government and research institutions) and summarise the lessons learnt to date.
61. Assuming the pilot programs demonstrate success and potential for large scale commercial development, Government and Industry Partners will need to understand what policy levers will be available to stimulate and support the emergent cattle breeding industry and investment. Research into policy options to support the industry should commence once initial results are evident. Policy options include providing incentives for investment, improving supporting infrastructure and investing in extension services (animal health, disease spread, reproduction, and feed supply) to support both commercial and small holder operations (and their interaction).