

INDONESIA AUSTRALIA
RED MEAT & CATTLE
PARTNERSHIP



INDONESIA-AUSTRALIA COMMERCIAL CATTLE BREEDING PROGRAM

Progress Report

July – December 2019



IACCB
Indonesia-Australia Commercial Cattle Breeding Program

Contents

Executive Summary.....	1
1 IACCB Program – a Red Meat and Cattle Partnership Initiative	1
2 IACCB Extension – Objectives.....	2
3 Herd Growth, Feeder Costs and Commercial Results	2
3.1 Breeding Brahman Cross Results in Significant Herd Growth.....	2
3.2 Indonesia Feeder Production Costs vs Australian Imported Feeder Costs	3
3.3 Internal Rate of Return, Cash Flow and Pay-back Periods	4
4 Factors impacting on sustainable commercial viability.....	5
5 Breeding Model Results	6
5.1 Cut-and-Carry: Promising productivity but success dependent on on-going support	6
5.2 SSKA – proven to be commercially viable	8
5.3 Open grazing – commercial results	11
5.4 Semi-Breedlot	13
6 Promotional Events.....	13
7 Industry Support.....	15
7.1 Technical Guidance	15
7.2 Skills Development	15
7.3 Research.....	16
7.4 Support for enabling policy.....	16
8 Industry Interest and Investment.....	17
9 Management and Operational Systems.....	17
9.1 Personnel	17
9.2 GESI	17
9.3 Risk Management and Mitigation	18
10 Planned Activities 2020.....	18

Annexes

1. Theory of Change
2. Summary of Partner progress
3. Capacity Building Activities
4. IACCB Outreach to Government and Industry
5. Potential Investor Interest
6. Women Participation in Partner Enterprises
7. Partner Profile Summary
8. Risk Management Analysis and Action

List of Figures

Figure 1: IACCB BX Cattle Breeding Models.....	1
Figure 2: SISKA organic growth versus cattle investment – commercial outcomes.....	11
Figure 3: View of the IACCB Developed Industry Tools	15

List of Graphs

Graph 1: Original herd numbers and number of calves born to date.....	2
Graph 2: Progeny status	3
Graph 3: Indonesia Feeder Production Cost vs Australian Imported Feeder Cost.....	4
Graph 4: IRR per breeding model at year 10.....	4
Graph 5: Calving rate per small-holder partner	7
Graph 6: Weaning rate per small-holder partner	7
Graph 7: Estimated production costs of feeders in four SISKA partners	9
Graph 8: Calving Rate in SISKA Partners	9
Graph 9: Weaning Rate in SISKA Partners	9
Graph 10: Open grazing calving rate.....	12
Graph 11: Open grazing weaning rate	12
Graph 12: Calving rate in semi-breedlot.....	13
Graph 13: Weaning rate in semi-breedlot.....	13

Abbreviations

ASG	Advisory Support Group
BCS	Body Condition Score
BNT	Bio Nusantara Teknologi
BKB	Buana Karya Bhakti
CAP	Cahaya Abadi Petani
DAWR	Department of Agriculture and Water Resources
DFAT	Department of Foreign Affairs and Trade
EOPO	End of Program Outcomes
FFB	Fresh Fruit Bunch (production)
GESI	Gender Equality and Social Inclusion
Gol	Government of Indonesia
IACCB	Indonesia-Australia Commercial Cattle Breeding program
IRR	Internal Rate of Return
KAL	Kalteng Andinipalma Lestari
KPI	Key Performance Indicator
KPT	Koperasi Produksi Ternak (Farmer Cooperative)
M&E	Monitoring and Evaluation
MLA	Meat and Livestock Australia
MoA	Ministry of Agriculture
RMCP	Red Meat and Cattle Partnership
ROI	Return on Investment
STA	Short Term Advisers
SISKA	Sistem Integrasi Sapi dan Kelapa Sawit (Cattle-Oil Palm Integration)
SPR	Sentra Peternakan Rakyat (Community Livestock Centre)
SUJ	Superindo Utama Jaya
TL	Team Leader
TOC	Theory of Change

Executive Summary

Over the last 6 months the Indonesia-Australia Commercial Cattle Breeding Program (IACCB) has made significant progress towards achieving its End of Program Outcomes (EOPOs). Four out of IACCB's eight partners have reached, or are close to reaching, the end of their third year of breeding Brahman Cross (BX) cattle. Key performance indicators for most partners are showing positive stabilizing trends that support commercial viability, albeit with relatively small profit margins. These results, for each model, are however very dependent on continuous professional management.

Cattle hand-over has now been completed in 6 out of the 8 partners, all of whom are independently managing their herds, with IACCB providing regular monitoring support and technical backstopping. The two remaining partners are Cahaya Abadi Petani (CAP), who failed their Commercial Viability Assessment, and Pusat Pelatihan Pertanian dan Pedesaan Swadaya Karya Baru Mandiri (P4S), who only started cattle breeding 10 months ago, and will be assessed for commercial viability in 2020.

Preliminary conclusions on the models are as follows:

- » The small-holder cut-and-carry model can deliver high productivity, leading to commercial viability, but only if there is consistency in professional herd management. BX cattle breeding is challenging at a small-holder level, especially within communally managed commercial sized enterprises. Success will very often be dependent on the availability of on-going external financial and technical support that guarantees feed supply and funds for feed supplements at times of reduced green fodder.
- » The SSKA-model has proven to be commercially viable in well-managed enterprises that maintain full integration of plantation and cattle operations, so that both are mutually supportive. Consistent professional management of the enterprise and the availability of experienced staff remains the core challenge for future expansion.
- » The open-grazing model is commercially attractive if broad acreage of native or improved pastures is available. The provision of additional feed does however remain a key-factor in achieving commercial Key Performance Indicators (KPIs) and a competitive cost-of-gain.
- » The semi-breedlot model, like many Indonesian breedlots, suffers from the high cost of raising breeding stock semi-continuously or continuously in a cattle-yard. High operational and feed costs result in feeder live-weight cost exceeding that of feeders imported from Australia.

Although all four breeding models differ significantly, the prerequisites for commercial viability are similar to those encountered by other breeding enterprises, small or big, in or outside of Indonesia. They include the need for a long-term investment commitment, cash-flow guarantee, a good understanding of the direct link between commercial viability and KPIs¹ and consistent professional herd management by the stockmen/women. However, as Indonesian breeding enterprises are still in a learning phase, these prerequisites take on added importance.

The reporting period saw an increased interest in the work of IACCB from the government and the private sector. This was largely due to the Ministry of Agriculture (MoA) plans to support an increase in cattle numbers by optimizing palm oil concessions, and feedlot owners wishing to comply with the new Big Ruminant Import regulation that requires breeders to import at a rate of 5% of total feeder imports. Feedlot owners are wishing to understand the potential impact on their profit margins, and the potential application of the small-holder cut-and-carry model to ensure compliance. IACCB has actively engaged with all interested stakeholders and provided access to IACCB learnings. The increased interest in IACCB results bodes well for industry growth.

¹ Examples include conception rates, calving rates, weaning rates, and ADGs of calves, weaners and grower/feeders

The main challenge over the last 6 months has been the prolonged dry season which impacted on the availability of green fodder and agricultural by-products. All partners successfully maintained Herd Body Condition Score (BCS) after taking on advice from IACCB that ensured nutritionally complete diets based on locally available products. Current herd condition provides a good base to maintain or exceed KPIs during the coming rainy season.

The next 6 months will see the conclusion of the commercial viability analysis of all four models, a heightened focus on the communication of results and IACCB learnings and continued technical support to partner led cattle breeding training centres and consultancies. The commercial nature of these centres and government backed training operations should facilitate the on-going supply of skilled staff and managers, which remain a core barrier to industry growth. Ideally, such operations will be replicated in all high potential cattle breeding regions, enabling country wide industry growth.

1 IACCB Program – a Red Meat and Cattle Partnership Initiative

IACCB, which commenced on 5 February 2016, was established under the auspices of the Indonesian-Australian Partnership for Food Security in the Red Meat and Cattle Sector (Partnership).

The initial 3-year program aimed to establish commercially sustainable cattle breeding models that facilitate investment, innovation and expansion of the beef cattle breeding industry in Indonesia. A no-cost 2-year extension was granted in February 2019 to consolidate findings and promote lessons learnt.

This report summarizes program results to date and provides an overview of progress for the July-December 2019 period.

The project design required three breeding models to be tested, as follows.

1. Siska – Integrated Oil Palm and Cattle Production where cattle are rotationally grazed within an oil palm plantation
2. Open Grazing – extensive broad acre grazing in open grassland
3. Cut-and-Carry – small-holder farmers manage cattle in a cattle yard and supply green fodder and agricultural by-products for feed.

One Siska partner, SUJ in Lampung, modified their model so that their cattle are now grazing in their oil palm plantation for around 6 months per year, prior to being placed in a breedlot for 6 months during conception, pre-calving and weaning - a model called Semi-breedlot.

Figure 1: IACCB BX Cattle Breeding Models



2 IACCB Extension – Objectives

The 2-year (February 2019 – February 2021) IACCB extension focuses on:

1. conclusively determining the commercial viability of three cattle breeding models, and
2. promoting the successful models to industry and government stakeholders and informing them of the potential of, and barriers to, industry growth.

IACCB’s focus over the reporting period, July-December 2019, has been to progress the achievement of these two objectives.

Productivity and financial data were consolidated for partners whose projects have been operating for at least 3 years. Commercial viability was then assessed by entering productivity² and financial³ KPIs into the respective financial model, to calculate commercial indicators such as internal rate of return (IRR), time frame to a cash-flow positive status, and net present value. Modelling of the economies of scale for each model is on-going, in response to interested investor queries. See section 5 for more detail.

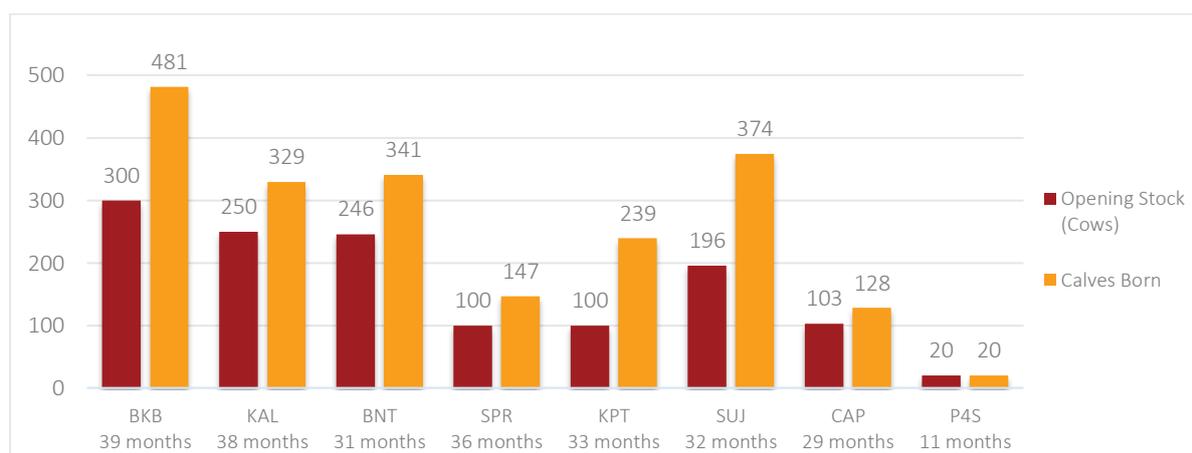
The reporting period also saw IACCB actively communicating commercial results, breeding tools and breeding guidelines to key stakeholders in government and the private sector. Activities included organizing the Integrated Cattle Oil Palm Production (ICOP) 2019 Conference and presenting at various events. See section 6 for more detail.

3 Herd Growth, Feeder Costs and Commercial Results

3.1 Breeding Brahman Cross Results in Significant Herd Growth

IACCB granted 1,429 cattle (1,315 female and 114 male) to our 5 partners. This herd has grown substantially with the addition of 2,059 calves, 357 of which were born July – Dec 2019. See Graph 1.

Graph 1: Original herd numbers and number of calves born to date

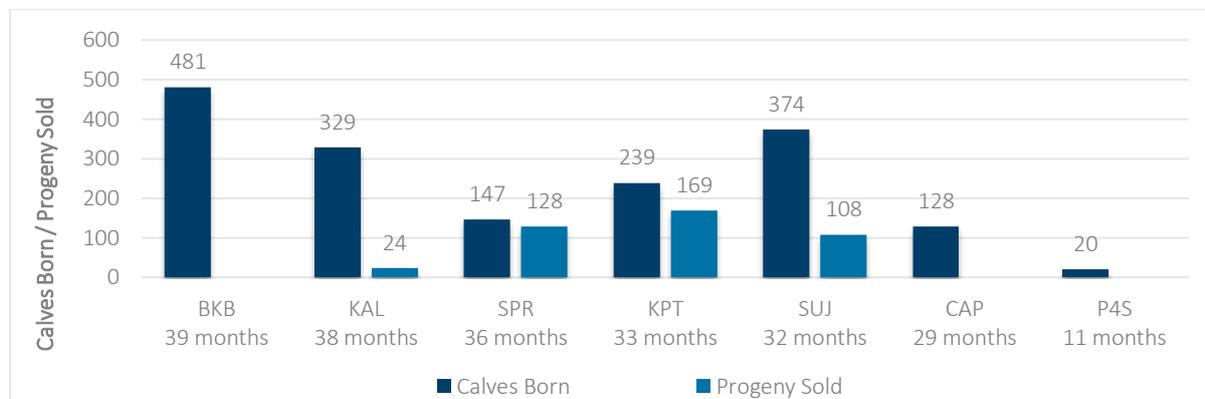


² Including – conception rates, calving, weaning rates and ADGs,

³ Including - operating costs and estimated sales price

SISKA partners (Buana Karya Bhakti – BKB, Kalteng Andinipalma Lestari – KAL, Superindo Utama Jaya - SUJ) are retaining a significant number of their progeny, except for BNT⁴ which stopped cattle production on 30 August 2019. Small-holders such as Koperasi Produksi Ternak (KPT) and Sentra Peternakan Rakyat (SPR)⁵, who needed quick cash-flow, sold more of their progeny. See Graph 2 for progeny status until the end of December 2019.

Graph 2: Progeny status



SISKA partners have on average sold 15% (between 0% and 29%) of their male progeny for the lucrative Qurban market, after growing them to feeder or slaughter size. Several partners have achieved a 50% Qurban premium compared to normal market prices. Their best heifers (females) have been retained following IACCB training on selection criteria.

Our small-holder partners have tended to sell both male and female off-spring much faster than our SISKA partners. Heifer calves are often sold to other members of the cooperative or to individual farmers in the neighbourhood, providing an opportunity for more farmers to start their own BX cattle breeding enterprise.

3.2 Indonesia Feeder Production Costs vs Australian Imported Feeder Costs

Our partners now have between 2.5 and 3 years of BX cattle breeding experience across various environments and models. Sufficient data is now available to make confident judgments on commercial viability. Robust commercial viability assessments have been conducted on all four models. The assessments have found that well-managed enterprises are able to consistently meet the required productivity performance indicators needed for sustained commercial viability.

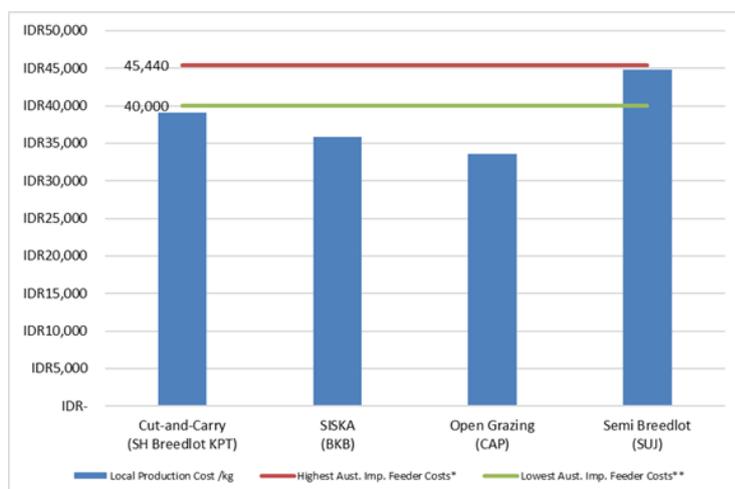
Graph 3 outlines projected cost per kg liveweight for a 320 kg feeder produced by the best-performing IACCB partners for each breeding model, compared to Australian imported feeder costs⁶. The cost estimate considers KPIs such as conception and weaning rates, calving intervals, Average Daily Gains (ADGs) and feed and operational costs, all of which differ significantly for each partner. The fact that small-holder cut-and-carry, SISKA and open grazing models can produce feeders at a lower cost than Australian imported feeders, bodes well for industry growth. The higher production cost for semi-breedlot is due to higher feed and operational costs and suggests that this model may not be commercially viable if productivity does not reach levels comparable to breedlots.

⁴ BNT, feeling the brunt of the declining palm oil prices and the down-turn in the sector phased out of cattle breeding and organic fertilizer on the 30 August 2019.

⁵ CAP and P4S are more recent partners and haven't sold their Year 1 progeny.

⁶ Production costs in Australia are approximately 30% cheaper than in Indonesia but freight cost from Australia adds about 25% of the CIF (Cost, Insurance and Freight).

Graph 3: Indonesia Feeder Production Cost vs Australian Imported Feeder Cost



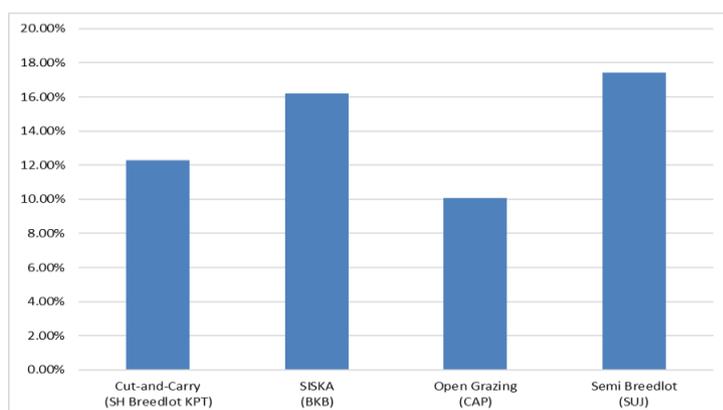
Note: Source for Lowest and Highest Imported Feeder Cost from MLA Market Information 2019

*Highest = February 2019 - **Lowest = April 2019

3.3 Internal Rate of Return, Cash Flow and Pay-back Periods

Well-managed enterprises, for all four breeding models, are projected to achieve an IRR of between 10-18% at year 10, after considering the inclusion of herd terminal value⁷. See Graph 4. Improved IRRs can be achieved if all benefits to the enterprise are considered. For Siska, cattle reduce weeding costs, and provide additional organic matter via cattle manure, both of which improves oil palm fresh fruit bunch (ffb) productivity⁸. For cut-and-carry partners, the sale of manure, either unprocessed or turned into compost, generates additional, quick and on-going income, supporting cash-flow, which is often a main barrier to commercial viability.

Graph 4: IRR per breeding model at year 10



⁷ Herd Terminal value is calculated based on the expected number of cattle at the end of the 10-year period and on the local sale price of cattle, considering the specific strategy of the partner. For instance, it is expected that BKB will have 2,787 head of cattle, CAP 496 head and SUJ 1,668 head of cattle based on their strategy of culling, selling and maintaining progeny.

⁸ Initial findings show a 5-12% increase in fresh fruit bunch production in the oil palm plantations. IACCB is working with BPPT to confirm these findings, via research conducted in two plantations in Kalimantan.

A cash flow positive status can be achieved by year 4 for all models, dependent on their herd expansion strategy. Early and optimal cash-flow positive status can be achieved when all progeny, bulls and heifers are sold at a feeder weight of 280-320 kgs, achieved at approximately two years of age. Retaining most of the female progeny to expand the herd will delay this cash-flow positive status.

Purchasing pregnant breeders will result in a much faster positive cash flow, as progeny can be sold early in the third year. This strategy is useful for small-holders where cash-flow is a significant challenge to increasing their herd size.

Pay-back period is projected at between 8-10 years for all models.

4 Factors impacting on sustainable commercial viability

Although all four breeding models differ significantly, some common prerequisites for sustainable commercial viability have emerged. These are not significantly different from those encountered by other breeding enterprises, small or big, in or outside of Indonesia. However, as Indonesian breeding enterprises are still in a learning phase, the prerequisites take on added importance.

Common criteria to realise commercial potential, viability and sustainability in all models are as follows:

- » Investor or co-operative long-term financial commitment to the breeding enterprise, supported by an investment plan and cash-flow projections, that ensure all issues can be resolved in a timely manner, in particular the purchase of additional feed during the dry season. This is particularly important for new enterprises.
- » Cattle integration into the existing farming system:
 - SSKA – ensuring the material integration of plantation and cattle enterprises so they are mutually supportive, with the plantation as the host and the cattle as guests benefiting from the grass and plantation by-products;
 - Small-holders – ensuring the carrying capacity of each farm is not exceeded in terms of green feed production and/or cash-flow availability generated from other activities.
- » Understanding the direct link between commercial viability and KPIs such as conception rates, calving rates, weaning rates, and ADGs of calves, weaners and grower/feeders. Timely collection and analysis of KPI data, followed by quick action, as required, to avoid short and longer-term impact on productivity.
- » Consistent professional herd management by the stockmen/women.
- » High quality and sufficient feed. This is particularly important during prolonged dry seasons, as experienced during this reporting period. Access to additional feed sources such as palm kernel cake, rice bran, and cassava by-products, is essential to keep the herd in good condition and to ensure KPI targets such as ADGs are maintained.

5 Breeding Model Results

5.1 Cut-and-Carry: Promising productivity but success dependent on on-going support

IACCB smallholder partners, over their 2.5 years of enterprise management, have proven that commercial KPIs, such as conception, calving and weaning rates and cost of gain can be promising if enterprises are well-managed. Well-managed enterprises can become cash-flow positive in Year 3 and obtain an IRR of 12% after 10 years. BX cattle breeding is however challenging at a small-holder level, especially within communally managed commercial sized enterprises.

Commercial viability is challenged by a long return-on-investment period, and significant cash-flow demands, especially to maintain cattle condition during the long Indonesian dry season. Another significant challenge is the lack of cohesiveness of the farmer groups. To be successful small-holder cooperatives require strong leadership and transparent management. There is a tendency for farmers to revert to their traditional cattle breeding approaches, characterized by limited concern with long calving intervals or fluctuating BCS. BX cattle are sensitive to fluctuating BCS and productivity decreases considerably when it drops below 3⁹.

IACCB's experience has shown that with sufficient technical support the challenges identified above can be significantly reduced/overcome. This does however highlight the importance of ongoing government or private sector support for small-holder models if commercial viability is to be sustained.



Cattle handover in SPR witnessed by District Livestock



Cattle handover ceremony in KPT witnessed by Bupati

Since passing Commercial Viability Assessments after 18 months of operations, our two longer-term small-holder partners, Koperasi Petani Ternak Maju Sejahtera (KPT) in South Lampung and Sentra Peternakan Rakyat Mega Jaya (SPR) in Bojonegoro have effectively managed their BX cattle herds, resulting in improved livestock productivity and reduced costs, further confirming their commercial viability.

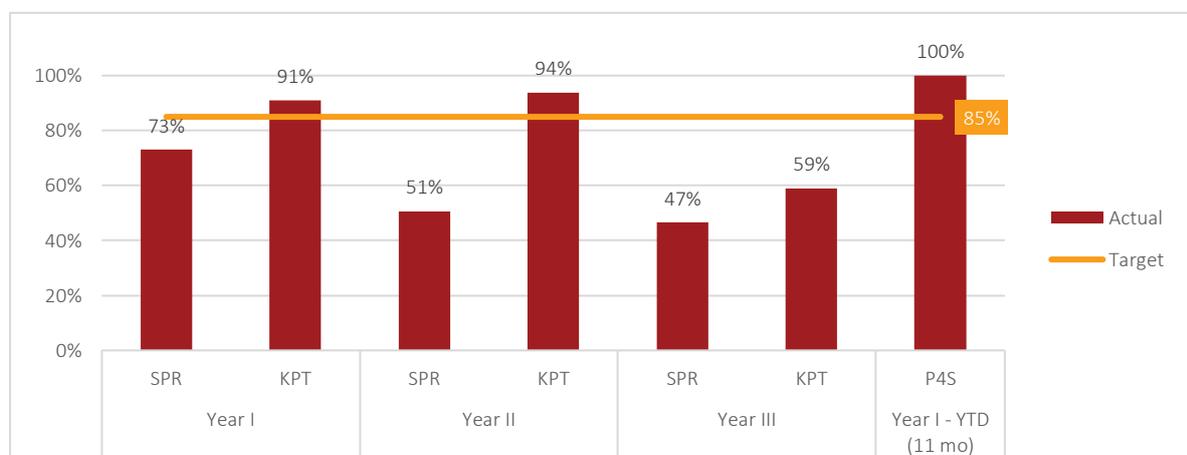
In line with the collaborative agreement between IACCB and the partners, IACCB formerly handed over the cattle to both organizations, in September and October 2019 respectively. Before hand-over IACCB conducted Partner Progress Assessments that analysed the condition of the herd and productivity data. This process highlighted a number of partner action items to further improve productivity and commercial sustainability.

The two partners now manage the herd independently, with IACCB providing technical support as required, to deal with emerging issues. IACCB is now conducting monthly monitoring visits where we focus our communication efforts on the importance of maintaining animal welfare.

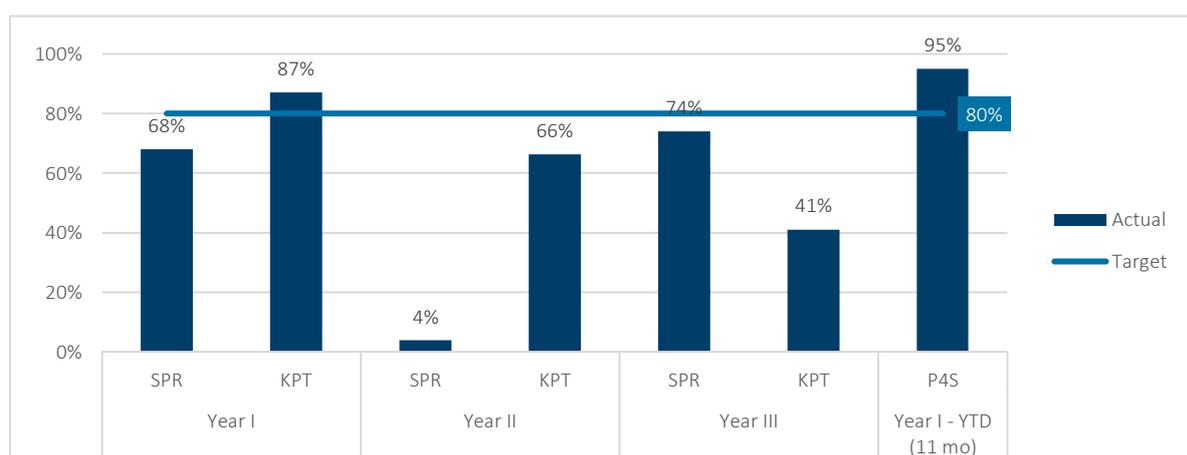
⁹ Body Condition Scoring (BCS) is a low-cost, hands-on method to determine the condition (amount of fat cover) of cattle. BCS scores range from 1 – 5, with 3 being the benchmark for high productivity. (<https://www.beefresearch.ca/research/body-condition-scoring.cfm>)

Graphs 5 and 6 below summarize the calving and weaning rate for the three cut-and-carry small-holder partners. The 100% calving rate for P4S was due to IACCB providing pregnant cattle in February 2019, at project commencement.

Graph 5: Calving rate per small-holder partner



Graph 6: Weaning rate per small-holder partner



KPT has achieved excellent results to date, including the production of 215 calves within a 2.5-year period¹⁰ from an original herd of 100 cows, and strong weaning rates – a core indicator of commercial viability. Recent pregnancy tests indicate that the KPT herd will increase by another 42 calves by the end of its third year in early 2020. These positive results are due to the consistent high-quality management of the herd and the provision of sufficient quantity and measured quality of feed.

This intensive management, which is often associated with small-holder systems, resulted in the active monitoring of the herd and immediate action when issues were spotted. Most KPT-farmers have access to finance, through collaboration with investors or through bank loans. As a result, they were able to buy feed during the long recent dry season.

SPR has struggled to maintain consistent herd condition. They are farming in a more challenging environment - Bojonegoro in East Java, where a long drought and prolonged dry season (May – November 2019) has made it impossible to grow green feed. Their access to finance is limited, with only a small number of smallholders having obtained a personal loan. From May 2019 up to end of 2019 SPR's cattle survived on rice straw treated with urea, supplemented with palm kernel cake. SPR's recent experience highlighted the importance of gaining access to feed or finances, if commercial sustainability is to be maintained.

¹⁰ Until December 239 calves have been born

Although facing challenges, as described above, SPR has become a local exemplar in organizational development. The Bojonegoro Livestock Agency is replicating SPR's farmer cooperative strengthening approach, with support from IACCB and Gita Pertiwi¹¹, in five other farmer cooperatives in the district.



SPR Farmers providing green fodder to the cattle



KPT Member Year 1 Progeny

P4S, a Village and Agricultural Training Center in Central Kalimantan, is now raising the progeny of its 20 pregnant heifers supplied by IACCB in February 2019. All calves were weaned in the reporting period and most cows are pregnant again. Pregnancy testing will be conducted in January 2020, likely confirming a short calving interval – a strong indicator of commercial success.

The P4S training institution was established in Kubu village and is managed by individual farmers. In the reporting period, P4S, with support from IACCB, expanded its training curriculum to include BX cattle management. This is now being delivered to farmers and interns from various vocational schools in Central Kalimantan.

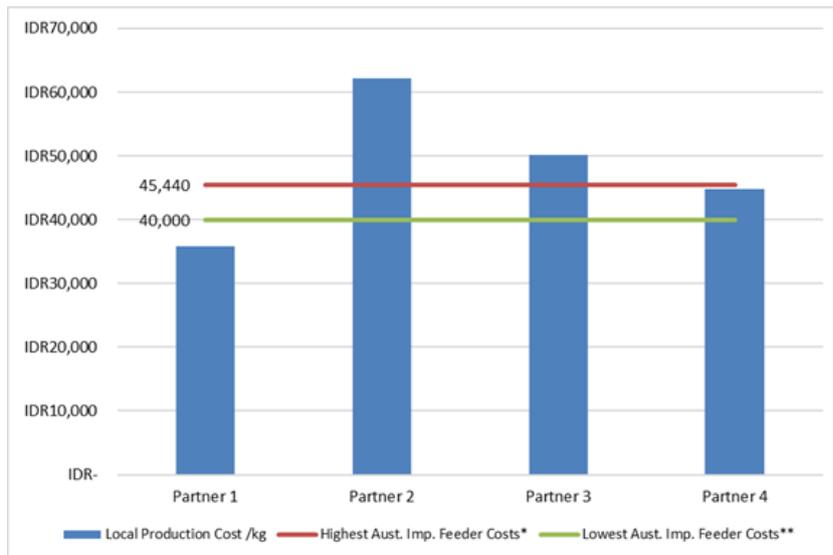
P4S is likely to be an ideal replication model for the government, as it started with minimal capital - 20 pregnant cows – and has successfully grown from that humble start. Its commercial prospects are strong, in part due to the additional income obtained from cattle manure compost sold to a large Central Kalimantan market. Every month it produces 20 tons of compost, which is sold at between Rp.800/kg to Rp.1.000/kg, which ensures sufficient cash-flow to raise initial stock and progeny.

5.2 SSKA – proven to be commercially viable

Commercial analysis of data from our four SSKA (cattle breeding in oil palm plantations) partners, who have between 2.5 and 3 years of BX cattle breeding experience, highlight relatively high productivity and commercial outcomes, which could be further improved by business expansion. Well-managed SSKA enterprises have been proven by IACCB to have strong commercial potential. They can produce feeder cattle (average 320 kg) at around the same or lower live-weight cost than the cost of imported Australian BX feeders. Three of the SSKA partners are now investing to build new infrastructure and increase their breeding stock.

¹¹ Gita Pertiwi is an NGO providing consultancy services in organizational development, institutional strengthening, financial management and business plan development.

Graph 7: Estimated production costs of feeders in four SISKA partners



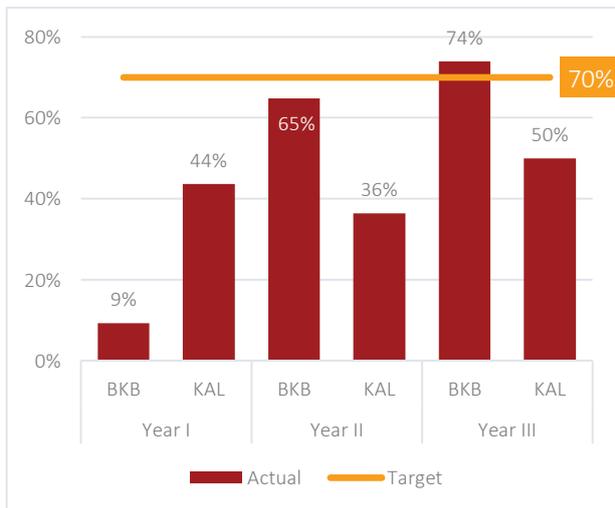
Note: Source for the lowest and highest imported feeder cost from MLA’s 2019 market information.

* Highest = February 2019

** Lowest = April 2019

There are however significant differences in the production cost of feeder cattle between partners – see Graph 7. Production cost is greatly influenced by KPI results. Average calving rates (see Graph 8) over 3 years range from 69% for the best-performing partner to only 43% for the worst performing partner, and for calf mortality 5 and 15% respectively. Both KPIs severely impact weaning rates (see Graph 9). ADG also heavily influences commercial results, which range from 0.25 kg to 0.6 kg/hd/day. ADG impacts the cost of gain when feed and operational expenses are relatively similar.

Graph 8: Calving Rate in SISKA Partners



Graph 9: Weaning Rate in SISKA Partners



Professionally managing the herd is key to SISKA commercial success, most importantly to ensure that KPIs such as weaning rates and average daily gains/cost of gain are achieved in an efficient and effective way. IACCB experience has shown that sustainable commercial viability can only be achieved when there is an optimal integration between the plantation and the cattle enterprise, so that they are mutually supporting. The plantation provides feed for the cattle including native grass, palm fronds, and palm kernel cake, and the cattle provide weeding services and additional organic matter, potentially increasing fresh fruit bunch yield.

Professional SISKAs management requires experienced staff, including ranch manager and stockmen/women, who have a passion for the cattle industry. Adequate technical skills and experience are essential to proactively identify issues in the herd and to address them in an effective and timely manner. IACCB Siska partners have struggled over their three years of operation to attract experienced cattle stockmen/women and cattle breeding managers. The lack of suitable staff and management is a key barrier to industry growth. Considerable industry and government efforts will be required to overcome this significant constraint.

Siska-partners have started exploring the fattening market. Two partners, KAL and SUJ, are establishing simple feedlots at their sites, and have succeeded in achieving ADGs between 0.7 kg and 0.8 kg/hd/day, at a cost of between Rp.10.000/hd/day and Rp.24.000/hd/day. Cost-of-Gain (feed only) is below Rp.15.000/kg for SUJ, who has access to cheap agricultural by-products, which bodes well for commercial viability.

The third Siska partner, BKB, which has access to an extensive plantation grazing area, is producing grass-fed feeders and slaughter animals. They are also analysing local market potential, as their annual production is estimated to increase to about 300 head per year.



Electric fencing for managing rotational grazing



Cattle in the cattle yard waiting for pregnancy testing

Investment for a productive herd of 300 BX cattle in a Siska model is estimated at AUD\$650,000¹². Operational expenses for the first three years, after which income can be earned from selling year 1 male progeny as feeders, will be AUD\$350,000 to AUD\$400,000, depending on the feed supplements provided. IACCB is researching the commercial viability of smaller herds and associated economies of scale.



Improved pasture under a palm plantation

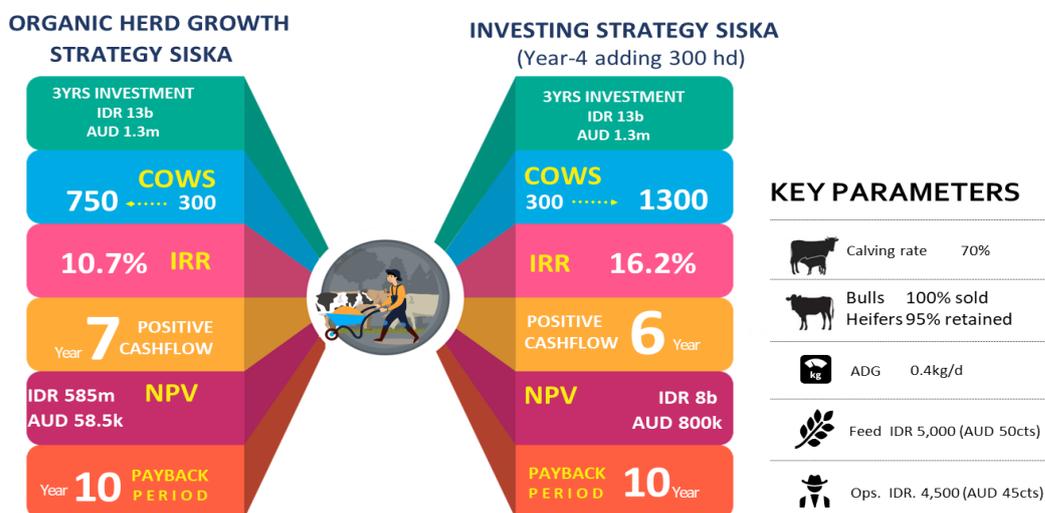


Heifers and their progeny in BKB

¹² Based on partner data

Using data from our partner, BKB in South Kalimantan, Figure 2 below compares herd number growth, IRR, cash-flow and NPV for a herd with organic growth - retaining most heifers but selling male progeny, compared to a herd that was expanded with an additional 300 cattle in Year 4.

Figure 2: Siska organic growth versus cattle investment – commercial outcomes



Organic growth results in a relatively low Net Present Value at year 10 of approximately AUD\$58,500. This figure increases substantially to about AUD\$800,000 if an additional 300 cows are procured in year 4, for an additional investment of about AUD\$500,000. This will enable the herd to grow organically to about 1,300 by year 10 and achieve a quicker cash-flow positive condition and an improved and impressive IRR of up to 16.2%.

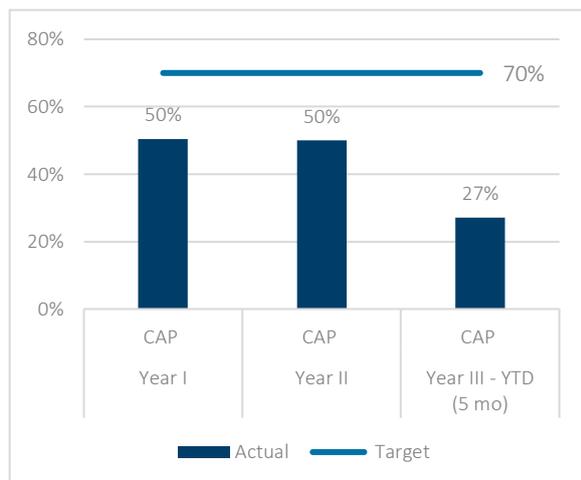
5.3 Open grazing – commercial results

The open grazing model can be commercially attractive if broad acreage of native and or improved pastures is available. Native pasture is however low in quality. Nutritional value can be improved by planting improved pasture species, which need between 6 months and 1 year to become fully established. Providing additional feed such as palm kernel cake, rice bran and rice straw treated with urea has helped IACCB’s open grazing partner, CAP, to maintain cattle BCS during the most recent dry season without destroying the newly established grassland. CAP has had success expanding their improved pasture acreage, however this will need to continue in 2020 to accommodate a growing herd.

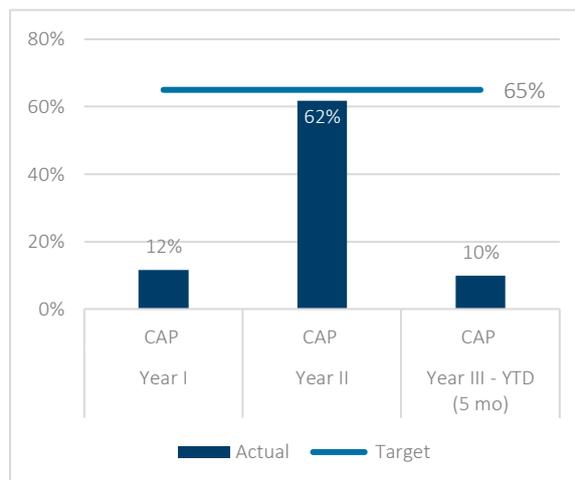
CAP is located in an area very susceptible to low rainfall and an extended dry season, unlike other districts in South Kalimantan. The 2018 prolonged dry season highlighted the need for additional feed if BX cattle are to maintain their productivity and BCS. Graph 10 and 11 shows the drop in BCS during this season and the long time required to recover to a BCS of 3, which negatively influenced calving and weaning rates in 2019.

During this reporting period (July – December 2019) CAP has maintained strong herd management, including feed supplementation, which should result in improved conception and calving rates in 2020. The low weaning rate and the relatively low ADG of 0.25kg/hd/d, resulted in CAP failing to pass their Commercial Viability Assessment. Their next assessment is planned for February/March 2020.

Graph 10: Open grazing calving rate



Graph 11: Open grazing weaning rate



The open-grazing model, where large tracts of land are available for grazing, has much lower starting capital requirements and lower daily expenses compared to other models. Projected IRR, with current low productivity achievements, is still 10%. CAP will achieve cash-flow positive status in 2019, after selling year one progeny.

The open-grazing model could be used by companies that need to rehabilitate ex-mining land through pasture development. IACCB was approached by Ausmincham (Australia Mining, Infrastructure, Energy & Resources Chamber in Indonesia) to share its findings on this model and pasture development.

The CAP ranch in Tanah Laut Regency has attracted government and banking sector officials eager to learn how to address systemic challenges in the sector. Several government agencies are working with CAP to become an on-site training site for local farmers and to convince financial institutions of the commercial viability and opportunities in the cattle sector.



Open grazing area in CAP



Cattle in pen being fed urea treated rice straw

After lobbying by BUMP (Badan Usaha Milik Petani¹³), the Coordinating Ministry of Economic Affairs launched the Cattle Business Credit and Inclusive Financing Support for Economic Sustainability Scheme¹⁴ at the Islamic Boarding School Ushuluddin, the umbrella Foundation of CAP. The KUR Scheme provides easier access to capital, a core challenge for smallholder farmers. Fifty farmers have been identified by CAP to receive loans of up to IDR 25 million. Loans for cattle fattening have been provided. Loans for trading and breeding are still being negotiated.

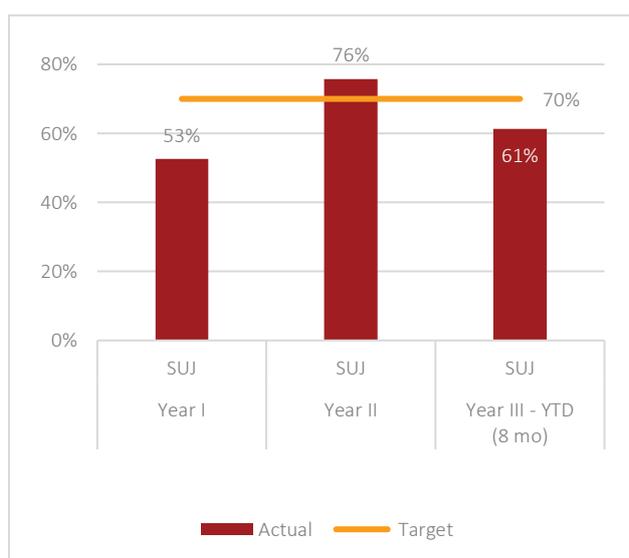
¹³ Badan usaha Milik Petani (BUMP) is a national agency, supported by MoA, providing backstopping and capacity-building to farmer groups in several areas in Indonesia. BUMP provides linkages between these group to reduce bottlenecks, e.g. facilitating marketing or providing access to agricultural by-products.

¹⁴ "KUR Peternakan Rakyat dan Implementasi Keuangan Inklusif Mendukung Kemandirian Ekonomi"

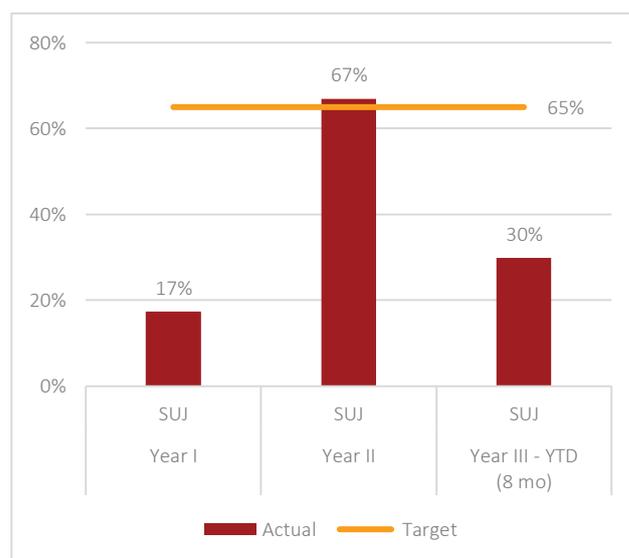
5.4 Semi-Breedlot

This model emerged after a SISKA-partner - SUJ - wanted to expand their herd but were constrained due to their limited grazing area in their relatively small oil palm plantation. As a result, pregnant cows and mother-and-calves are kept in a cattle yard (breedlot) pre-calving up to weaning and re-conception, for approximately 6 months. Production cost are high, but SUJ can fatten feeders with cheap agricultural by-products. The more intensive management (compared to SISKA), especially pre-and post-calving, has considerably increased calving rates (as cows are mated in the yard while still lactating) and reduced calf mortality – see Graph 12 and 13¹⁵.

Graph 12: Calving rate in semi-breedlot



Graph 13: Weaning rate in semi-breedlot



6 Promotional Events

Now that IACBB is heading towards its final year of operation and has 2.5 to 3 years¹⁶ of project results, the IACCB team is focusing on communicating results. This task is made easier by the strong commercial potential of the SISKA model and the increasing interest in cattle breeding from the government and private sector, feedlots and oil palm companies. IACCB and its partners have received numerous invitations to share their findings – as follows.

The Integrated Cattle Oil Palm Conference (ICOP 2019) was held on the 23rd October in Jakarta with over 240 delegates attending. ICOP, convened by the Agency for the Assessment and Application of Technology (BPPT), IACCB and the Partnership, was the first platform in Indonesia that explored the latest developments in cattle oil palm integration, including commercial opportunities, day-to-day operational management, and challenges. The conference provided an opportunity for government agency staff, academics and industry players to exchange experiences, network, and access information on new business opportunities and innovations.

Whilst challenges remain ICOPs overall message was that cattle integration in oil palm estates held great commercial potential. BPPT identified 4.4 million ha of oil palm plantations in Indonesia as having potential for cattle integration. At a stocking rate of 5 ha per head, this could potentially support over 800,000 cattle.

¹⁵ Year 3 data YTD data covers 8 months (May - Dec) but is already showing a positive trend.

¹⁶ Depending on the start of the collaboration some partners have completed their third year of BX cattle breeding where others are only at 2.5 years.



Ir. Wisnu Wijaya Soedibjo, MT (BKPM) discussing SISKA business opportunities and Paul Boon, presenting IACCB Findings at ICOP

The following events provided an additional opportunity for IACCB to present its findings.

- » MoA initiated “Modelling of Cattle and Oil-Palm Integration” seminar, attended by government officials and private sector partners, with the aim of developing a government backed National SISKA Model.
- » “The 11th Asia Sustainable Oil Palm Summit”, where IACCB delivered a presentation and Q&A on 'Sustainable Practices on Integrating Cattle Breeding into Palm Oil Plantations' to an international audience of oil palm plantations owners and producers, millers, traders, and palm oil research institute staff.
- » “Roundtable meeting on Oil Palm – Cattle integration”, hosted by the Indonesian Agency for Agricultural Research and Development (Ministry of Agriculture), which ensured an on-going exchange of findings between SISKA projects and government agencies, to inform policy.
- » “Nusafest 2019” initiated by the key Indonesian Oil Palm Research Institute and PT Holding Perkebunan Nusantara (PTPN – holding company of state-owned companies). IACCB presented on SISKA’s commercial viability and the strong potential for cattle breeding in state owned oil palm plantations¹⁷.
- » “Livestock Production and Veterinary Technology National Seminar” to present on “Challenges of Smallholder Cattle Breeding - Towards the 4.0 Era”.
- » “The 8th Indonesia-Australia Partnership on Food Security in the Red Meat and Cattle Sector Meeting” to inform on “IACCB’s Investment Outcomes” - covering Commercial Viability Assessment results and recommendations for industry expansion.
- » “MLA Importers-Exporters Meeting” that brought together cattle business stakeholders from Australia and Indonesia who were interested in learning about breeding BX cattle and related opportunities and challenges.
- » “Musyawarah Nasional II GAPUSPINDO” (Indonesian Beef Cattle Business Association National Meeting) whose members have shown an interest in partnering with oil palm plantations to comply with the recent Regulation of the Minister of Agriculture (Permentan 41/2019) on the Import of Big Ruminants.



¹⁷ The government of Indonesia, through the state-owned companies, manages about 5% of the total oil palm plantations. Small-holders manage 55% whereas the remaining 40% is managed by private companies.

7 Industry Support

Over the last 6 months IACCB has actively supported industry in its efforts to solve some of its main growth challenges, namely technical guidance, skills shortages, research and enabling policy.

7.1 Technical Guidance

CALFIN, CALPROS and CALPROF and our Cattle Breeding Manual were officially launched during the ICOP Conference. All are available, free of charge, from the IACCB website - www.iaccbp.org. One hundred and eighty copies of the manual have been distributed to interested parties and 60 requests for downloading the industry tools were received through the IACCB website over the last three months. The manual and tools are clearly responding to an important industry need.

Figure 3: Industry tools and technical guidance developed by IACCB



Indonesian banks have tools for assessing short-term loan applications in cattle fattening, but no instrument is available to assess cattle breeding. Banks are consequently very interested in CALFIN, the financial modelling tool developed by IACCB. In the reporting period IACCB delivered presentations on CALFIN to BRI Agro in Jakarta and Bank Indonesia in Lampung.

7.2 Skills Development

IACCB is supporting several exciting industry-backed initiatives that aim to overcome a critical constraint to industry growth – the lack of experienced professional cattle breeding managers and staff.

BKB, in South Kalimantan, has leveraged their 3-years of hosting visitors and sharing their cattle breeding experiences, by setting up a “SISKA Center of Excellence”. The Center offers three commercial packages including, (i) a one-day Agro-tourism visit; (ii) a 3-day SISKA basic training; and (iii) a 7-day advanced SISKA training. BKB plantation and livestock managers are frequently invited by MoA, Local Governments, research institutes such as Indonesian Oil-palm Research Institute, and interested companies, to present on their SISKA implementation experiences. BKB also host university students who are researching issues associated with cattle breeding, and is establishing a SISKA consultancy unit. IACCB is supporting BKB in all these efforts, with a focus on commercializing all opportunities.

CAP, South Kalimantan, has recently established the P4S-Ushuluddin, a training centre for agriculture and village self-development, that focuses on extensive cattle breeding management. The MoA – Balai Besar Pelatihan

Pertanian Binuang, South Kalimantan, provides training facilities and equipment, and links them with several Vocational Agricultural High Schools (Sekolah Menengah Kejuruan Pertanian) to enable student internships. CAP is now preparing to market these training opportunities to other technical schools, farmer groups, and the local livestock agency. IACCB is providing on-going technical support, with a focus on ensuring CAP can consistently deliver high quality technical training.

P4S is now offering 3-day basic and a 7-day advanced cattle breeding training at its newly established BX cattle farm. P4S has also recently added cattle breeding to its 3-month on-the-job training packages, in a collaborative arrangement with eight Agricultural Vocational Schools. The MoA government training body, BBPP Binuang - Balai Besar Pelatihan Pertanian Binuang, from South Kalimantan, also provides support by sending lecturers, office supplies, training materials and machinery.

The commercial nature of these industry and government backed training operations should facilitate the on-going supply of skilled staff and managers. Ideally, they will be replicated in all high potential cattle breeding regions, enabling country wide industry growth.

7.3 Research

The ICOP conference provided a unique opportunity to pull together a wide range of SSKA research outcomes. This included results from programs undertaken by BPPT, IACCB, ACIAR's IndoBeef, IPB University, and Gadjah Mada University. Issues explored included cattle palm integration challenges, feeding systems, reproductive performance, animal health and financial analyses. The proceedings, currently being finalized by BPPT, will serve as a valuable reference document for the government, private sector and other stakeholders.

IACCB, BPPT and Indobeef's PalmCow are continuing their research collaboration on Ganoderma¹⁸, and the impact of SSKA on fresh fruit bunch production and soil compaction. Results of the research will be available and widely communicated in the first quarter of 2020. Oil palm plantation managers and owners have shown great interest, considering the positive preliminary findings of increased fresh fruit bunch production resulting from cattle integration.

7.4 Support for enabling policy

National government interest in SSKA is at an all-time high. IACCB and its partners have presented SSKA results to the MoA on numerous occasions over the reporting period. For example, in October staff from the MoA Directorate Feed and the Directorate Processing and Marketing Livestock Products visited BKB. The new Indonesian Minister of Agriculture, Syahrul Yasin Limpo, recently announced SSKA expansion as one of MoAs strategic priorities, with the view to supporting beef self-sufficiency in Indonesia. The minister is encouraging the application of the SSKA-model from the current 0.90% of oil palm plantations, to 20%. In September IACCB contributed to the MoA initiated "Modelling of Cattle and Oil-Palm Integration" workshop. This model will be instrumental in realizing the Ministers goal.

After Ministry of Cooperatives and Small-Medium Enterprises senior staff attended the hand-over of IACCB cattle in KPT-Lampung, and after discussing key-achievements with KPT and IACCB, they are now requesting further information. They wish to further develop their small-and-medium size enterprises development plans, which currently focuses on traditional trade and retail sectors, by including the agricultural sector.

¹⁸ Cattle integration in palm-oil plantations is/was widely believed to spread Ganoderma that causes reduction in productivity and die-off of oil palm trees.

8 Industry Interest and Investment

This reporting period saw heightened stakeholder interest, including government and private sector, in IACCB findings. Oil palm company representatives and GAPKI (Indonesian Oil Palm Association) and GAPUSPINDO (Indonesian Beef Cattle Business Association) members have shown particular interest, driven by several new and existing government policies.

The new Big Ruminant Import regulation requires feedlot operators to import breeders at 5% of their import recommendation, issued by the Government. IACCB's breedlot technical guidelines, tools and lessons learnt from IACCB projects will provide feedlot operators with options and guidance to ensure compliance, and to analyse the potential impact on their profit margins.

The Minister's goal of applying the SSKA-model and the ongoing drive of the MoA to increase cattle numbers to achieving beef self-sufficiency, is also fuelling the increased interest. Lessons learnt from IACCB SSKA projects and SSKA technical manuals and tools, will support the Minister's wish to optimize the 14 million¹⁹ hectares of oil palm plantations. They will also provide an opportunity for companies to commence or increase collaboration with small-holder farmers already involved in oil palm plasma operations.

The small-holder cut-and-carry model, heavily favoured and supported by the government, provides an ideal model for collaborative commercial ventures between feedlots and farmer cooperatives. In December 2019, PT Pramana Austindo Mahardika (PAM), who own the Elders feedlot business and abattoir, requested advice from IACCB to trial BX-cattle breeding in collaboration with a woman cooperative 'Kooperasi Wanita Pusaka Pertiwi' (KWPP). The goal is for KWPP to manage PAM heifers, with both parties benefiting commercially. In January 2020, IACCB will facilitate a peer-to-peer learning visit to KPT, where KWPP members can learn, see the results of good management, and form solid working relationships with KPT members. IACCB will provide smallholder guidelines and tools and other advice to KWPP and PAM, as required.

Annex 5 summarizes current investor interest.

9 Management and Operational Systems

9.1 Personnel

During this reporting period no staff changes took place. Staff performance assessments were completed for all staff.

9.2 GESI

The last 6 months saw IACCB continue its efforts to increase partner understanding of GESI, and its application. The physical nature of the industry and the remote partner locations are however proving to be a disincentive for women to apply for or to maintain long-term roles in the industry. PAMs potential collaboration with KWPP, as described above, is however very promising. The number of women involved in partner enterprises, or in IACCB capacity-building activities, has not changed significantly over the last 6 months. See Annex 3 and 6.

¹⁹ Due to topography, climate conditions, soil composition and other factors it is estimated that only about 4 million hectares might be suited to trial SSKA

9.3 Risk Management and Mitigation

An updated 'Risk Management Analysis and Action' matrix is provided in Annex 8. Several risks are inherent to the business of cattle breeding in Indonesia, which compared to cattle fattening, is less lucrative, is highly capital intensive, a long-term investment and prone to policy changes.

The import of Indian buffalo meat and Brazilian meat, both cheaper than the current government regulated market price, has very likely decreased investor appetite. Long-term prospects for a profitable cattle breeding business are now under question. This is acutely also felt by small-holders engaging in breeding or fattening activities, whose small margins are being undercut, due to reduced meat and cattle prices. These beef import policies directly counter the government's goal of increasing the availability of locally produced meat.

Animal welfare remains a key priority for IACCB. The recent prolonged dry season over all of Indonesia, and in some places lasting for 7-8 months (May to December) severely depleted feed resources in almost all partner sites (except for BKB in South Kalimantan where occasional rain occurred). This could have had significant impacts on animal welfare. The picture below shows the impact of the long dry season on local pasture development and pasture availability in Lampung area which encountered a very long dry spell.

IACCB supported partners to trial alternative feed sources which succeeded in maintaining the overall condition of the herd. IACCB also continued to maintain partner understanding of the link between well-kept and healthy animals and productivity and profits.



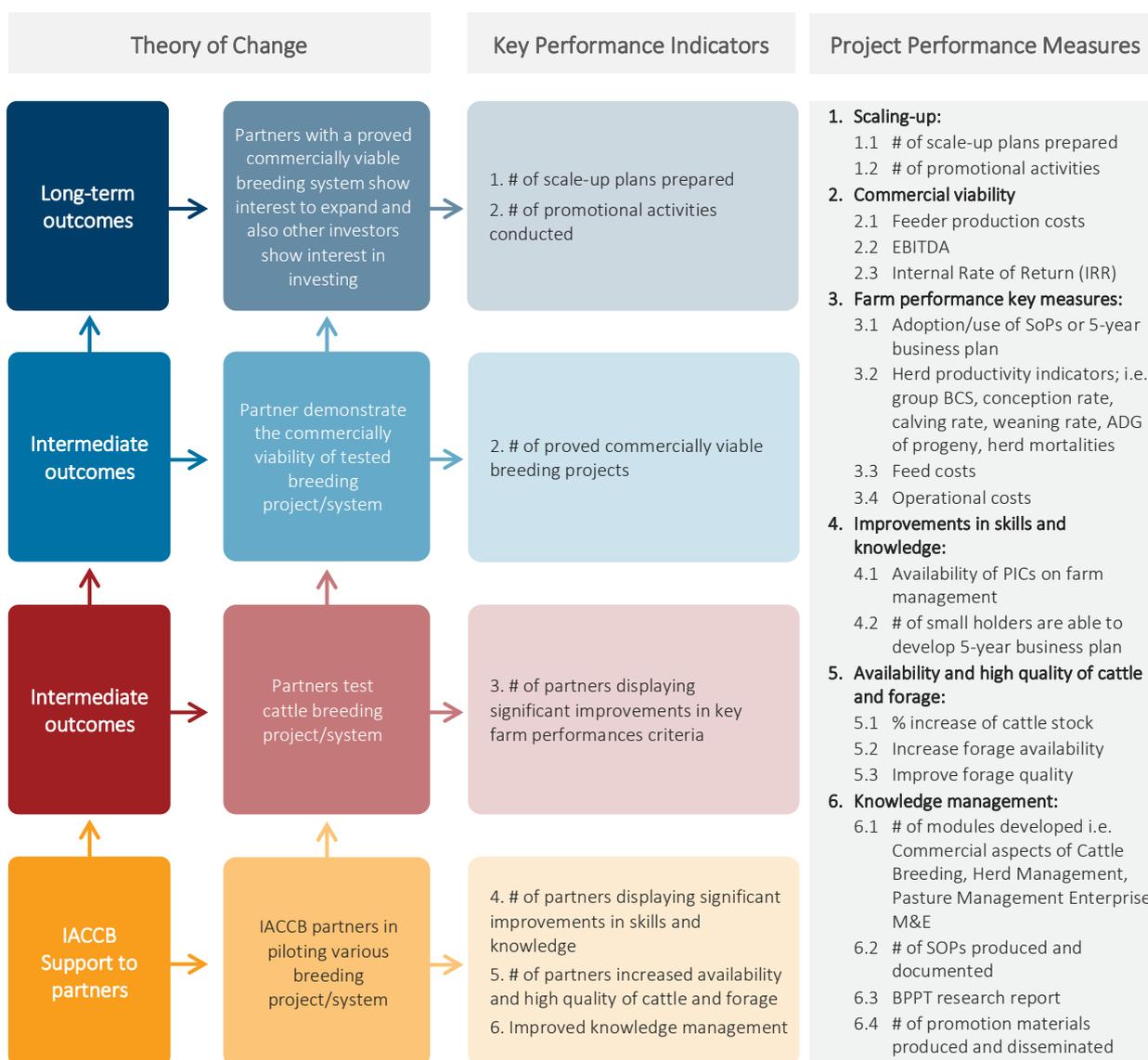
SUJ (Lampung) where local pasture undergrowth was totally eliminated due to the prolonged dry season

10 Planned Activities 2020

The 2020 – 2021 Annual Plan, will detail key-activities in IACCB's last year of operations. The focus will be on consolidating findings around the commercial viability of the four breeding models, and a continuation of promotion and industry support activities, with a focus on encouraging and supporting interested investors to start breeding enterprises. Towards the end of 2020 a completion report will be developed that will summarize and reflect on the 5-years of IACCB.

Annex 1: Theory of Change

Goal: Expansion of the beef cattle breeding industry in Indonesia
End of Program Outcome 2: Demonstrated increase in interest/investment in sector
End of Program Outcome 1: Demonstrated commercially viable beef cattle breeding models



Annex 2: Summary of Partner Progress

Annex 2.1. PT. Buana Karya Bhakti (BKB) – A SISKa partner in South Kalimantan

a. 6-month activity updates.

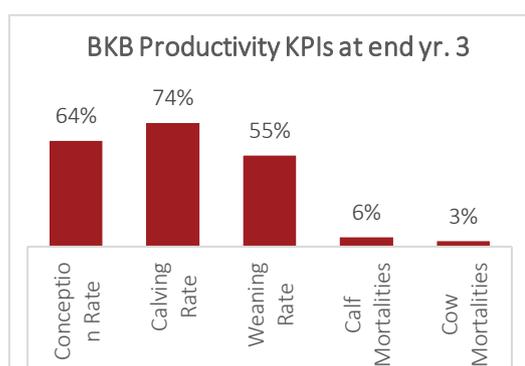
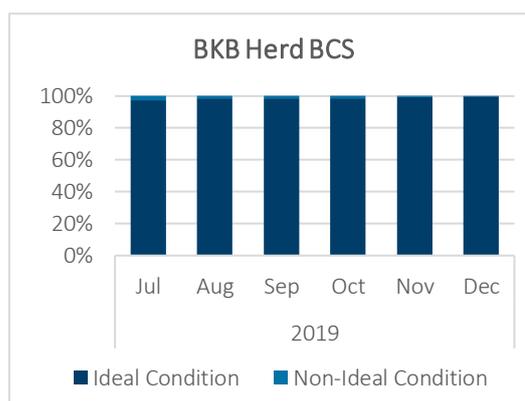
- Started trialing CALPROF by installing software and related infrastructure and conducting data migration
- IACCB / BKB Management meeting to discuss future planning and strategy, particularly related to new investments in 300 breeders and infrastructure
- Retained 24 heifers from year 1 progeny and invested in 30 pregnant cows at cost of approx. AUD\$100,000.
- Establishing a SISKa Center of Excellence that offers three commercial training-packages including: (i) a one-day Agro-tourism visit; (ii) a 3-day SISKa basic training, and (iii) a 7-day advanced training in SISKa
- Received award from Ministry of Agriculture for BKB commitment in implementing a SISKa project



BKB received award from MoA

b. Cattle Productivity and Cost

- BKB has maintained excellent herd condition within this reporting period. A supporting factor was the rainfall spread which, although limited, saw rain over the whole year, resulting in an increased quantity of pasture.
- BKB completed their 3rd year in September 2019. The conception rate is stabilizing at around 70%, while calving and weaning rates are showing positive trends with around 70% and 55% respectively.
- Over three years BKB is almost reaching KPI targets.
- Within this period, calf and weaner mortalities has been significantly reduced due to improved stockmen capacity. At month 3 in Year 4, a conception rate of 17%, a calving rate of 20% and a weaning rate of 13% and a weaners/growers ADG of 0.40kg/hd/d has been achieved. BKB is the most commercially viable SISKa partner, with feeder liveweight production cost considerably below imported costs.



BKB Feeder Liveweight Production Cost/kg

IDR 35,800 vrs Aust. Import costs of between IDR 40 and 45,000

Annex 2.2. PT. Kalteng Andinipalma Lestari (KAL) – a SISKAs partner in Central Kalimantan

a. 6-month activity updates

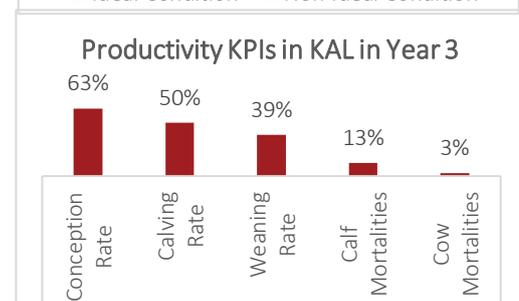
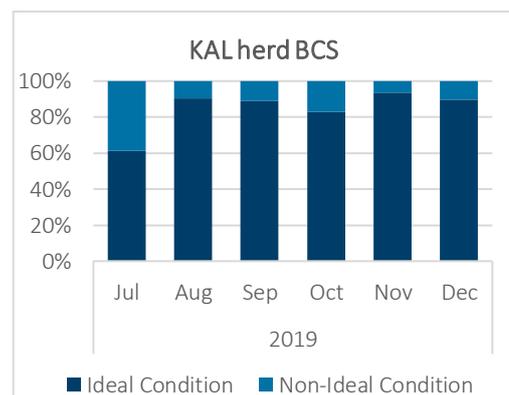
- Started trialing CALPROF by installing software and related infrastructure and conducting data migration. KAL administration staff now actively running CALPROF.
- A management meeting with the plantation General Manager and KAL-ranch team was held to resolve specific issues including the late culling of unproductive cows and a very high feeder liveweight productivity cost. Top management is now requesting quick action.
- Started to fully implement the strategy for culling unproductive cows, to reduce costs.
- Conducted field visit to BKB to learn how to operate a SISKAs project in an effective and efficient way.



KAL visit to BKB observing the result of pasture development activities

b. Cattle Productivity and Cost

- The BCS of the cows has shown improvements since July 2019. During the dry season provided palm oil leaves for additional feed.
- KAL completed their 3rd year in October 2019. Conception rate for 3 years is averaging 67%. Calving and weaning rate are too low (and below target of 70%) ranging from 40% to 60%, mainly due to the high number of unproductive cows.
- Within the reporting period, calf and weaner mortalities have been significantly reduced while conception, calving, and weaning rate is close to 10% at a start of their 4th year which bodes well for YR4 performance. With weaners/growers ADG of 0.23, KAL is the least commercial amongst all SISKAs projects, with feeder liveweight production cost far above imported costs.



Feeder liveweight Production Cost/kg: IDR 62,200 compared to IDR 40-45,000 for imported feeders.

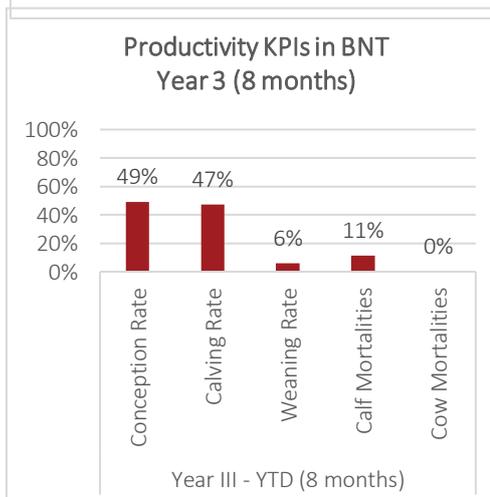
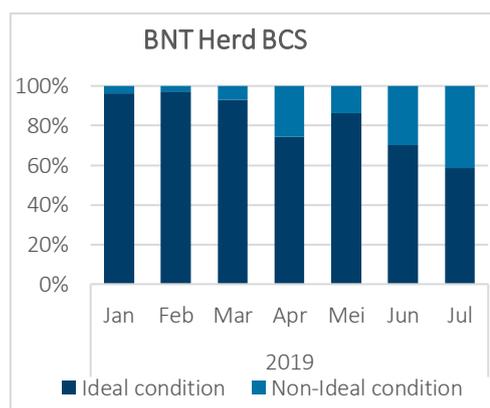
Annex 2.3 PT. Bio Nusantara Teknologi (BNT) – A SISKAs partner in Bengkulu

a. July-August activity update:

- Feeling the brunt of the declining palm oil prices and the down-turn in the sector, BNT phased out of cattle breeding and organic fertilizer production on the 30th August 2019.
- IACCB conducted a project closure meeting with BNT management to gather lessons learned. In summary:
 - BNT did not manage their breeding enterprise as a 24-hour a day business. This negatively impacted on the need to be fully operational e.g. night time staff, quick procurement of drugs.
 - There was insufficient integration between cattle unit and plantation, so synergies were not realized.
 - BNT found it hard to locate and retain good staff, and this remains a challenge all prospective cattle business in Bengkulu.
 - Social issues impacted the SISKAs enterprise, as local communities and the company competed for grazing land.
 - Pasture development was not prioritized, which had a direct negative impact on production costs and profit.

b. Cattle Productivity and Cost

- In April huge floods covered much of the BNT grazing area with mud. The graph shows that herd BCS has been unstable with only about 60% of the cows achieving BCS 2.6 and above.
- A lack of staff capacity, aggravated by the absence of key-management members on-site resulted in inconsistent herd management and feed supply, which impacted on BCS.
- BNT, ended their involvement in cattle breeding 4 months before the 3-year mark. The estimation of year 3 performance shows improvement on previous year's KPIs, but with a low ADG of weaners of 0.40/kg/hd/day and at a relatively high cost, feeder liveweight production cost was significantly higher than the cost of imported feeders.



Feeder liveweight Production Cost/kg:
IDR 50,100 compared to IDR 40 to IDR
45,000 for imported feeders.



Annex 2.4. Sentra Peternakan Rakyat (SPR): small-holder cut-and-carry model in Bojonegoro (East Java)

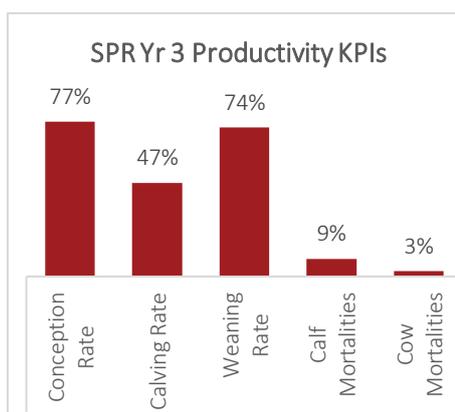
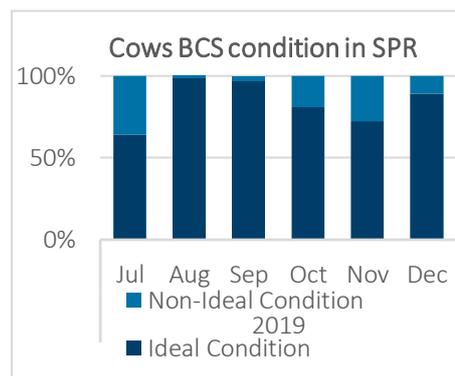
a. 6-month activity update

- On October 7th, 2019, cattle were formerly handover from IACCB, to become SPR property, as a sign of confidence that SPR is able to manage the cattle, and maintain animal welfare, with minimal support from IACCB. IACCB, through monthly field officer visits, continues to provide technical support on animal health, as required.
- Mr Sugiono, Director of Livestock Production in the MoA, together with district officials, visited SPR to understand key-factors for success, and challenges in BX breeding at a small-holder level.
- 34 weaners/growers were sold to support cashflow with a total revenue of AUD 25,000.
- SPR received organizational strengthening support from IACCB consultant Gita Pertiwi covering:
 - Establishing profit sharing system between SPR and members.
 - Financial impact calculation of supplying palm kernel cake (pkc) as feed concentrate.
 - Market analysis.



b. Cattle Productivity and Cost

- SPR was able to maintain BCS over the long dry season (May-December) which reduced forage availability. Forage was substituted with urea treated rice straw and additional concentrate (mainly Palm Kernel Cake). To reduce cash-flow pressure and ensure feed availability, SPR sold 13 unproductive cows and 2 bulls with a total sale of AUD 15,700.
- Third year figures show acceptable conception and weaning rates. Calving rate is below target of 65-75%. The reduction in BCS early in the year prolonged calving intervals. Overall weaner/grower ADG is low at 0.26kg/h/day against a target of 0.4-0.5kg due to the low quality of feed provided. Although costs are relatively low, the long calving intervals, and the slow growth has resulted in feeder liveweight production cost/kg slightly higher than cost of imported feeders.



Feeder Liveweight Production Cost/kg:
IDR 45,500 vs. IDR 40-IDR45,000 for
Australian imported feeders

Annex 2.5. Koperasi Produksi Ternak Maju Sejahtera (KPT): Small-holder cut-and-carry in Lampung

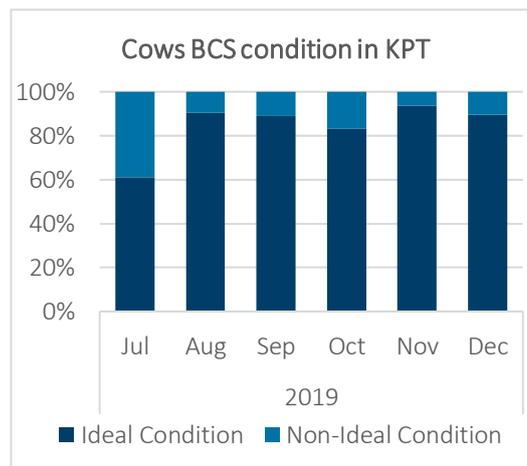
a. 6-month activity updates:

- On October 30th, 2019, cattle were formerly handover from IACCB, to become KPT property, as a sign of confidence that KPT is able to manage the cattle, and maintain animal welfare, with minimal support from IACCB (see photo). IACCB, through monthly field officer visits, continues to provide technical support, as required.
- KPT sold 82 weaners/growers for AUD 72,586 to support cashflow
- Gita Pertiwi support resulted in improving KPT management as follows:
 - Assigning person in charge to individual pens to manage cattle properly
 - Improve financial transparency – both income and outgoings for individual pens
 - Establish feed mill business to be able to supply quality feed to KPT members
 - Business diversification e.g. cattle education tourism and training center for students, and composting.

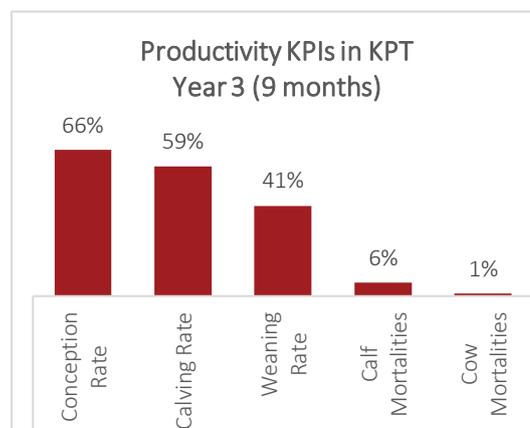


b. Cattle Productivity and Cost

- More than 75% of the cattle kept their BCS score above 3 even through the extended dry season (May – November). This indicates that KPT members have a good understanding of cattle nutritional requirements and are able to manage this throughout the year. Cashflow and access to finance remain a challenge, which results in KPT selling growers at a too early age.
- KPT have 3 months to complete their 3-year cycle. Currently, all productivity data is still below 1st and 2nd year targets, but KPIs are expected to improve in the last quarter of year 3. This together with an overall weaner/grower ADG of 0.38, KPT will likely produce feeder at a lower cost than imported cost.



Feeder liveweight Production Cost/kg:
IDR 39,100 vs IDR 40-IDR 45,000 for
Australian imported feeder cost



Annex 2.6. PT. Superindo Utama Jaya (SUJ) – Semi Breedlot Partner in Lampung

a. 6-month activity updates

- Invested in an additional 478 local cattle.
- Developed a nursery for indigofera seedlings which were planted in the grazing area at the start of the rainy season in December 2019.
- Continuously used organic fertilizer in the pasture development areas.
- A 3-month cost-of-gain trial for weaners using locally available feed components has shown good results with ADG of 0.79k/hd/day at a cost of IDR 9,094/day/head.

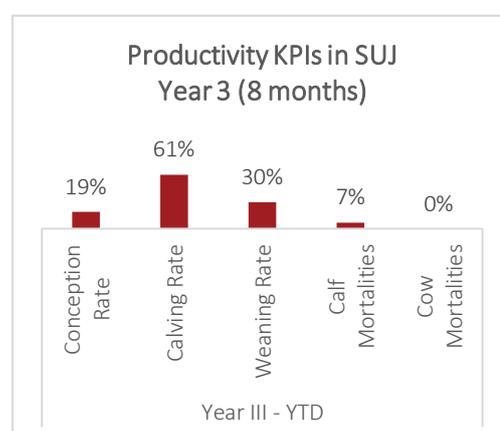
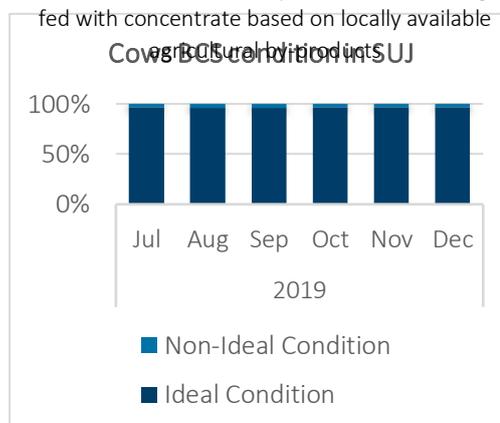
b. Cattle Productivity and Cost

Almost all cows are in good condition and targeted herd BCS of above 2.6 was maintained even during the long dry season (May-November) and ADG for weaners/growers averaged 0.60kg/hd/day which reaches the target. However, these positive figures were due to a high feed intake and associated high feed cost and higher feeder liveweight production costs compared to imported cattle.

- SUJ have 4 months until they complete their 3-year cycle. Currently, with additional investments of local cows, conception rate is showing a decreasing trend from the 2-year average of 80% (target 75-80%). Calving and weaning rate is expected to be similar, with the 2nd year hovering around 65% which is equal to the target.
- Current calf mortalities have shown a significant reduction compared to 2nd year rates due to a management decision to perform calving in a pen and not a grazing area, despite the associated increased in feed costs.



Imported and local SUJ cattle are still in good BCS condition even in dry season due to being fed with concentrate based on locally available



Feeder liveweight Production Cost/kg
IDR 44,800 vs IDR 40 to 45,000 for
Australian imported feeder costs.

Annex 2.7. PT. Cahaya Abadi Petani (CAP) – Open Grazing model in South Kalimantan

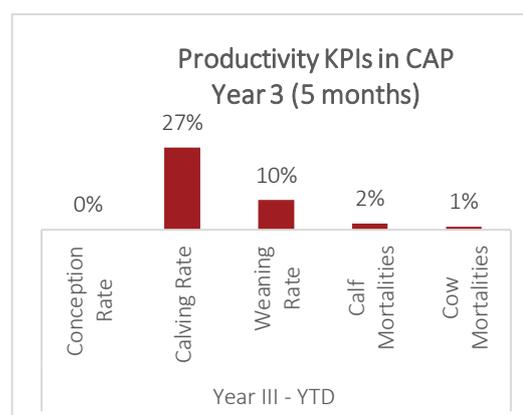
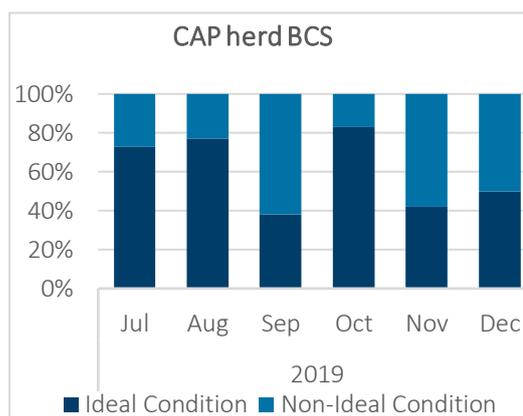
a. 6-month activity updates:

- Gita Pertiwi improved organizational capacity by:
 - Improving administration and financial processes, which assisted CAP in the establishment of a Pusat Pelatihan Pertanian dan Perdesaan Swadaya/Training Centre for Agriculture and Village Self-Development (P4S) called P4S-Ushuluddin, an agriculture training center that focuses on extensive cattle breeding management.
 - Restructuring the cattle breeding team, clarifying roles and responsibilities and providing clarity on staff salaries and other benefits.
- Conducted a 2nd Commercial Viability Assessment, which CAP failed due to a low IRR (less than 5%) due to low calving rates (averaging 50% against a target of 65-70%) and disappointing ADGs (0.21kg.day against a target of 0.4-0.5kg/hd/day) which impacted on feeder production cost. CAP has agreed various measures to improve project and commercial performance.
- On a monthly basis IACCB field officers provided technical assistance that focused on expanding the grazing area, electric fencing for weaners, animal handling, and feed alternative to fulfill protein needs.



b. Cattle Productivity and Cost

- Over the reporting period the CAP herd BCS has been unstable due to a long dry season (May-December) that significantly reduced forage availability. IACCB suggested the use of palm oil leaves as a substitute, which was inconsistently applied. A supply contract will ensure continuous supply of palm kernel cake and prevent inconsistent supply of additional feed.
- No pregnancy test was conducted in the reporting period, so conception rates will already be higher than in the graph. Tests will be carried out in February 2020. Several unproductive cows have been culled. The poor herd BCS (Averaging between 2 and 2.5 a target of 2.6-3.0) is negatively impacting on productivity KPIs. ADG of weaners is low at 0.21kg/hd/d (target 0.4). Due to the low cost of the forage (mainly grazing and low-cost rice straw), feeder liveweight production costs is still lower than imported feeder cost.



Feeder liveweight Production Cost/kg:
IDR 33,600 vs IDR 40 to IDR45,000 for
Australian imported feeders.



Annex 2.8. P4S - Pusat Pelatihan Pertanian dan Perdesaan Swadaya Karya Mandiri (Training Centre for Agriculture and Village Self-Development) – Cut-and-Carry partner in Central Kalimantan.

a. 6-month activity updates

- Support from Gita Pertiwi improved organizational capacity as follows.
 - Mapping out roles and responsibilities for all business operations.
 - Improving financial management, specifically recording and bookkeeping and cost calculation and competitive sale price for fertilizer and training for vocational students.
- Started providing a 3-month on-the-job training package in a collaborative arrangement with 8 different Agricultural Vocational Schools



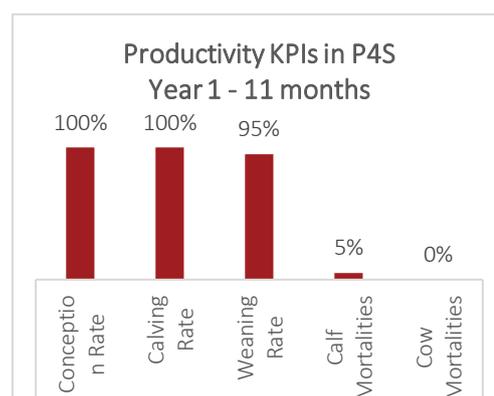
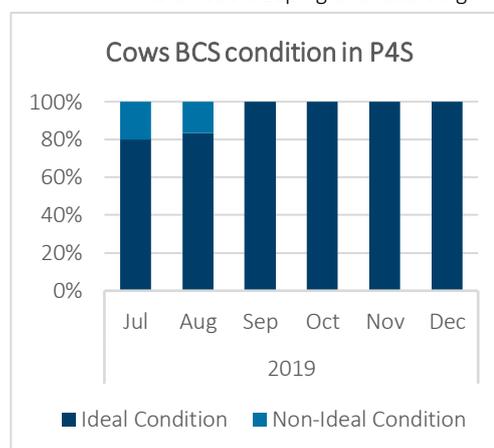
Ibu Tiwik from Gita Pertiwi (right) providing training to Bu Syahrin from P4S on bookkeeping and recording

b. Cattle Productivity and Cost

P4S fully understand the importance of maintaining BCS indicated in the improvement over the reporting period, and the current situation of 100% of the cows in good condition (>3 BCS). A similar improvement has been seen in weaner growth, from a very disappointing ADG of 0.14kg/hd/day in November to 0.23kg/hd/day in Dec 2019.

Based on a pregnancy test in October 2019, 8 cows (40%) were pregnant for their 2nd calf. It is expected that all cows are now pregnant (pregnancy test to be conducted end of January 2020).

It is still too early to determine commercial viability, however, the current ADG of only 0.23kg/hd/day is significantly lower than the cost of imported feeders.



Feeder liveweight Production
Cost/kg: IDR 28,400 vs IDR 40-45,000
for Australian Imported Feeders

Annex 3: Capacity Building Activities

Partner	Capacity Building activities	IACCB staff and Short-Term Advisors	Date
BKB	Pregnancy test, cattle selection and animal health training	<ul style="list-style-type: none"> Ross Ainsworth Investment Manager 	July 2019
	Field visit and sharing knowledge of palm-cow integration in Papua New Guinea	<ul style="list-style-type: none"> Jeff McInnerney (Numundo Beef – New Britain Plantation) Investment Manager 	October 2019
	Project Performance Assessment (6 monthly review)	<ul style="list-style-type: none"> Team Leader M&E Manager, Financial Advisor, Investment Manager 	December 2019
KAL	Pregnancy test, cattle selection and animal health training	<ul style="list-style-type: none"> Ross Ainsworth Investment Manager 	July 2019
	Animal health and general reproduction issues advice	<ul style="list-style-type: none"> Ross Ainsworth Investment Manager 	November 2019
	Project performance assessment and work plan	<ul style="list-style-type: none"> M&E Manager, Financial Advisor, Investment Manager 	December 2019
SPR	5 visits of Field Officer to conduct hands on trainings on SOPs of cattle management and monitoring of animal welfare	<ul style="list-style-type: none"> Field officer 	July, Aug, Oct, Nov, Dec 2019
	Program Performance Assessment and herd monitoring	<ul style="list-style-type: none"> Team Leader Investment manager 	July 2019
	Program Performance Assessment and Hand-over of cattle	<ul style="list-style-type: none"> Team Leader Investment Manager 	October 2019
	3 visits of the service provider to assist institutional strengthening on financial transparency and business planning.	<ul style="list-style-type: none"> Gita Pertiwi 	Aug, Nov, Dec, 2019
CAP (P4S-Ushuluddin)	4 visits of Field Officer to conduct hands on training on cattle management and monitoring of animal welfare	<ul style="list-style-type: none"> Field officer 	Jul, Aug/Sep, Oct, Nov 2019
	Program Performance Assessment and herd monitoring	<ul style="list-style-type: none"> Team Leader Investment Manager 	September 2019
	IACCB management team conduct Commercial Viability Assessment	<ul style="list-style-type: none"> IACCB Team Leader, M&E Manager, Financial supervisor, Investment manager 	December 2019
P4S-KM	Health, reproductive and general cattle management	<ul style="list-style-type: none"> Ross Ainsworth, Jul 2019 Investment Manager 	July and Nov 2019
	Follow-up advisor visit	<ul style="list-style-type: none"> Team Leader Investment manager 	July 2019
	Service provider visit to assist institutional strengthening on	<ul style="list-style-type: none"> Gita Pertiwi 	17-19 Oct 2019

Partner	Capacity Building activities	IACCB staff and Short-Term Advisors	Date
	organizational structure and financial management		
	Discussion on CVA after progress monitoring	<ul style="list-style-type: none"> • Team Leader • Field Officer 	November 2019
	6 visit of Field Officer to conduct hands on trainings of cattle management and monitoring of animal welfare	<ul style="list-style-type: none"> • Field officer 	Jul, Aug, Sep, oct, Nov and Dec 2019
KPT	Service provider visit to assist with financial management	<ul style="list-style-type: none"> • Gita Pertiwi 	14-16 Aug 2019
	Preparation for Hand-over and monitoring of pens	<ul style="list-style-type: none"> • Team Leader • Field officer 	July 2019
	Performance Assessment and cattle handover	<ul style="list-style-type: none"> • Team Leader • Field Officer 	September 2019
SUJ	Advising on cattle productivity, feed trials and work plan	<ul style="list-style-type: none"> • Team Leader • Field officer 	July 2019
	Information sharing of contract farming to produce and supply forages	<ul style="list-style-type: none"> • Field officer 	November 2019
	Financial management	<ul style="list-style-type: none"> • Financial advisor • Field officer 	December 2019
IACCB	Program strategy support	<ul style="list-style-type: none"> • Ben Mullen and IACCB Management Team 	9-12 Oct 2019
	SISKA Workshop	<ul style="list-style-type: none"> • Ben Mullen and IACCB Management Team 	22 Oct 2019
	ICOP Conference	<ul style="list-style-type: none"> • Ben Mullen and IACCB Management Team 	23 Oct 2019
	Program strategy support	<ul style="list-style-type: none"> • Ben Mullen and IACCB Management Team 	24-26 Oct 2019

Annex 4. IACCB Outreach to Government and Industry

Date	Key Person	Institution	Subject
August 7, 2019	Mr Wisnu Wijaya Soedibjo RCMP Board co-chair	BKPM	IACCB progress update ICOP Conference invite
August 8, 2019	Mr Kris Sulisto, Chairman Bilateral Committee for Australia - KADIN	President Director, PT Trimegah Hasanah Prima	IACCB progress update Supporting Gol breeding efforts and support for SPRs
August 20, 2020	Mr. Muladno and IPB team	Ex-DG Livestock and	Exchange small-holder breeding experiences with the goal to increase local cattle populations
September 12-13, 2019	11 th Sustainable Palm Oil Summit, Jakarta		Presenting IACCB experiences in SISKA (Paul Boon)
September 18, 2019	Round-table Oil Palm – Cattle Integration	IAARD (Indonesian Agency for Agricultural Research and Development)	Presenting IACCB experiences and plan (Paul Boon and Esnawan Budisantoso) to an audience of Badan Penelitian dan Pengembangan <i>Pertanian</i> , BPPT, Indobeef- PalmCow researchers, PT KAL and PT Astra Agro Lestari.
September 21, 2019	Dr. Ika Sumantri, M.Sc.	Indonesian animal science student association (ISMAPETI)	Presenting on “the opportunity of Indonesian commercial breed commercialization in the beef industry” (Esnawan Budisantoso).
October 1, 2019	Fadjar Sumping Tjatur Rasa, DVM, Ph.D	Director of Animal Health in DG of Livestock and Animal Health Services (MoA)	The director represented the DG in the meeting updating the MoA on IACCB in SISKA and small- holders (IACCB Team)
October 14, 2019	Heather Burrow	Team Leader Crop- Cow	Discussion on collaboration in PhD research on calf mortality (Paul Boon)
October 15, 2019	Dr Atien Priyanti Director ICARD	ICARD and Jember University	Presenting “Challenges on Cattle Breeding of Smallholder Farmers toward 4.0 Era” in the national seminar on “Livestock and Veterinary Technology to Support Food Resilience in the Industry 4.0” (Paul Boon)
October 15-17, 2019	Assistant Deputy for Fisheries and Livestock – Deputy of Marketing and Production	Ministry of Cooperatives Small and Medium Enterprises	Partners Meeting to “Improve The Productivity and Competitiveness of Small Medium Enterprises Livestock” (Cut Dara)

Date	Key Person	Institution	Subject
October 24, 2019	Stakeholders and Industries	ICOP Conference	A forum to discuss the opportunities and challenges around the cattle and oil-palm integration, and to encourage further collaboration and investment in promoting profitable cattle and oil-palm integration
November 4, 2019	The 8 th Partnership Meeting	RMCP	Promoting Strategic Dialogue in Responding to Digital Transformation in the Red Meat and Cattle Sector
November 7, 2019	The 2 nd National Conference	GAPUSPINDO	GAPUSPINDO's Role in Community Economic Empowerment (Paul Boon)
November 20, 2019	Ms. Valeska	MLA Importers-Exporters meeting	Sharing IACCB findings and results to Australian and Indonesia industry (Paul Boon)
November 29, 2019	Anas Ikhsanudin	Central Bank of Indonesia (BI) Lampung	Sharing experience on Cut and Carry model which is implemented by IACCB partner (KPT-MS) in Lampung (Cut Dara Permata Sari and Herman Yasin)
December 13, 2019	Jody Koesmendo	Secretary General Beef Council Indonesia	Update on breeding models specifically on small-holder involvement (Paul Boon)

Annex 5. Potential Investor Interest

No	Company/Originating Unit	PIC	Specific Interest
1	PT. Daya Semesta Agro Persada (DSAP)	Johan Prasetyo (Ops Mgr) Erik Setiawan (PresDir)	Cattle breeding in oil palm plantations in Palembang
2	PT. Citra Alam Semesta (CAS) – Sinar Mas Group	Anthony Usman (GM) Bramada WP	Cattle breeding in oil palm plantations
3	IBD International	Oka Simanjuntak – CEO	Rehabilitation of mining sites using the open grazing model
4	PT Agricinal	Musa Immanuel Manurung (Operation Director)	Information on the potential of BX cattle compared to Bali cattle. SISKAs already implemented by the company in Bengkulu using Bali cattle
5	PT PAM (Pramana Austindo Mahardika)	Jimmy Halim	Feedlot collaboration in BX breeding with farmer cooperative in Medan
6	PT PAM (Pramana Austindo Mahardika)	Jody Koesmendo	Small scale demonstration plot for BX breeding in West Java as potential for replication on government or private land
7	PT Juang Jaya Abdi Alam	William Bulo (General Manager)	Simulate cattle breeding partnership with smallholders using CALFIN
8	BI Provinsi Lampung	Anas Diksanudin dan Andi Danatar (Tim Program Kalster Ketahanan Pangan dan Pengembangan UMKM)	Simulate cattle breeding partnership with smallholders using CALFIN Explore the possible connection with local banks in Lampung to disseminate the results of smallholder's partners and introduction of CALFIN
9	Koperasi Jasa Profesi – Cipta Prima Sejahtera, Kalimantan Selatan	Totok Dewanto (Head)	A cooperative managing 3200 ha of palm plantation - interested in SISKAs
10	PT IPB (Indo Prima Beef) - Lampung	Nanang Purus (Owner)	Cattle breeding management in collaboration with small-holders.
11	MoA	DG Livestock/DG Perkebunan	Interested to learn from SISKAs experiences and see how small-holders (in the plantation plasma) can be involved. Visits to 3 partners planned for January 2020.
12	Ministry of Cooperative and SMEs	Budi Mustopo (Asisten Deputi Perikanan dan Peternakan)	Share lessons learnt and best practices on partnership with smallholders
13	Banks in South Kalimantan (BRI Syariah, BTN and BNI)	To be confirmed	These banks have partnered with CAP Share lessons learnt and best practices on partnership with smallholders and introduction of CALFIN

Annex 6. Women Participation in Partner Enterprises

Partner	Number	Remarks
BKB	20	Daily worker for pasture development activities
KAL	12	3 persons in admin role (2 persons in HO), 8 persons for pasture development, 1 person as cleaning service
SPR	3	1 person in management level, 1 person in admin, and 1 person from government official for supporting animal health issue
KPT	2	2 persons for taking care of the calves
SUJ	2	2 persons for pasture development activities in Nakau
CAP	6	1 person in administration and 5 persons in on-the-job training from vocational school.
P4S	35	1 person in administration and financial role, 34 persons in on-the-job training from vocational school.

Annex 7: IACCB Partner Profile Summary Update

	Partner	Breeding System	Province	Cattle delivered			IACCB & Partner Investment ²⁰ (AUD)			MoU signed	MoU Extension
				Received cattle ²¹	Number	Total	IACCB	Partner	Total		
1	Buana Karya Bhakti (BKB)	1. SISKA	South Kalimantan	Oct '16	300 Heifers	300 Heifers 30 Bulls	744,988 (48%)	812,398 (52%)	1,557,386	16.08.16	01.02.19
				Dec '16	12 Local Bulls						
				Jan '17	8 Imported Bulls						
				Aug '18	10 Imported Bulls						
2	Kalteng Andinipalma Lestari (KAL)	1. SISKA	Central Kalimantan	Nov '16	200 Heifers	250 Heifers 25 Bulls	697,065 (58%)	514,248 (42%)	1,211,313	31.10.16	01.02.19
				Dec '16	9 Local Bulls						
				Feb '17	50 Heifers						
					6 Imported Bulls						
				Aug '18	10 imported Bulls						
3	Bio Nusantara Teknologi (BNT) ²²	1. SISKA	Bengkulu	Jan '17	246 Heifers	246 Heifers 22 Bulls	643,306 (49%)	656,318 (51%)	1,299,625	01.11.17	01.02.19
				Jul '18	13 Imported Bulls						
					9 Imported Bulls						

²⁰ The \$ amounts indicate the total investment to date by both parties over the life of the project as per the feasibility assessment. This includes cattle, infrastructure, fixed and variable costs and a number of estimates including lease of land etc.

²¹ Marks project commencement, which is calculated from the time partners receive their cattle.

²² Bio Nusantara Teknologi decided to focus on key-business i.e. palm oil production and ceased cattle and organic fertilizer.

4	Sentra Peternakan Rakyat - Mega Jaya (SPR MJ)	3. Cut and carry	East Java	Jan '17	100 Heifers 3 Imported Bulls	100 Heifers 5 Bulls	254,586 (61%)	163,659(39%)	418,245	10.01.17	01.02.19
				Apr '17	1 Imported Bull						
				Aug '18	1 imported Bull						
5	Koperasi Produksi Ternak Maju Sejahtera (KPT MS)	3. Cut and carry	Lampung	Apr '17	100 Heifers 5 Imported Bulls 3 calves	100 Heifers 6 Bulls 3 Calves	253,739 (54%)	213,200 (46%)	418,245	12.04.17	01.02.19
				Jul '18	1 Imported Bulls						
6	Superindo Utama Jaya (SUJ)	1.SISKA/ Breedlot	Lampung	Apr '17	196 Heifers 10 Imported Bulls	196 Heifers 14 Bulls	485,049 (30%)	1,110,059 (70%)	1,595,108	24.04.17	01.02.19
				Jul '18	4 Imported Bulls						
7	Tugu Vanilla Jaya (TVJ) ²³	2.Open grazing	NTB	Technical Assistance Only			18,949 (26%)	55,000 (74%)	73,949	02.05.17	
8	Cahaya Abadi Petani (CAP)	2.Open grazing	South Kalimantan	Aug '17	103 Heifers – 8 Imported Bulls	103 Heifers 11 Bulls	366,444 (65%)	195,586 (35%)	562,030	03.07.17	01.02.19
				Aug '18	3 Imported Bulls						
9	Pusat Pelatihan Pertanian dan Perdesaan Swadaya Karya Baru Mandiri (P4S)	3.Cut and Carry	Central Kalimantan	Feb '19	20 Heifers 1 Bull (KAL)	20 Heifers 1 Bull	71,814 (72%)	29,398 (28%)	101,211	07.11.19	
All cattle delivered since Program commencement				1,315 Heifers, 114 Bulls - Total 1,429 Cattle			3,535,940	3,749,866	7,285,805		

²³ Collaboration with TVJ was ceased at the end of the third year due to technical difficulties in the ranch site.

Annex 8. Risk Management Plan and Action

Legend: L – likelihood, C – Consequence, R – Risk and 1 lowest, 5 highest (Risk: Low, Medium, High)

Risk	Impact	Probability			Risk mitigation approach	Entity Responsible
		L	C	R		
Political Risks						
Indonesia maintains a policy of significant meat imports including IBM, Brazilian box meat, and others which is sold widely at lower prices than locally produced beef.	Interest in investment in breeding cattle enterprises is greatly reduced	5	5	H	<p>Keep supporting partners develop efficient cattle herd production models to optimise profit.</p> <p>Red Meat and Cattle Partnership supports promoting the fact that cattle breeding can be profitable using IACCB applied research results in different models.</p> <p>Support interested parties to start breeding enterprises (breedlots, collaboration small-holders and feedlots, etc)</p>	<p>IACCB</p> <p>Red Meat and Cattle Partnership</p> <p>IACCB</p>
Macro – Institutional Risks						
Slowdown in investment in Indonesia due to the continual change of the regulatory framework	<p>Investors wary of investing in the industry.</p> <p>Limited number of partners scale-up their breeding enterprises</p>	4	4	H	<p>Communicate the impact of policy uncertainty on attracting investment to GOI.</p> <p>Partners strive for optimum efficiencies in enterprise management, allowing the business to more successfully confront external risks</p> <p>Partners are encouraged to interact with the government in order to convey messages hampering industry expansion and show success stories</p>	<p>Red Meat and Cattle Partnership</p> <p>IACCB</p> <p>IACCB</p>
Stagnating partner capacity and poor uptake of technology	Poor treatment of animals and poor productivity outcomes for the herd with low level profitability	3	4	M	IACCB team to continue to enforce adoption of herd management practices. Provision of high-quality technical assistance, training mentoring and support.	IACCB
Management practices do not reach industry standards resulting in inefficient and ineffective management	Enterprises suffering and not being able to proof commercial viability.	4	4	H	IACCB to keep convincing (through PPAs) that management practices need to be optimised to achieve KPIs that support commercial viability.	

Risk	Impact	Probability			Risk mitigation approach	Entity Responsible
		L	C	R		
Financial Risks and Operational Challenges						
Low IRR – cost of capital exceeding returns within the 5-year program time frame	Failed investment	3	4	H	On-going provision of high-quality advice and hard data on the need to reduce costs whilst maximising profitability	IACCB
Unable to establish a year-round viable feed supply due to cash-flow problems	Poor calving rates and long calving intervals, low production – unprofitable outcomes	3	4	M	Increase efforts to convince partners to establish better and expanded pastures and ensure cash-flow to buy agricultural by-products	IACCB
Organisational Risks						
Small-holder organisations suffer from inadequate cohesion and unity resulting in reduced ownership sense.	Commercial viability at risk as cash-flow and commitment to manage cattle properly is lacking	3	4	M	Working very closely with partners to improve transparency and accountability in the group and to clarify ownership of cattle.	IACCB and GP