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DRAFT

Applied Research and Innovation Systems in Agriculture (ARISA)

Semester Report No. 6, January 2018



EXECUTIVE SUMMARY

1. BACKGROUND

ARISA's overarching goal is consistent with those of all other AIP-Rural initiatives; to increase farm incomes for smallholder farmers in eastern Indonesia. In the case of ARISA this will be achieved through the adaptation and dissemination of innovations, leading to lifting the income of 10,000 farmers by 30%. The ARISA project seeks to strengthen farmer-relevant innovation at the research and business interface by increasing the capacity and incentives for public research institutes and universities to collaborate with agribusinesses to adapt existing innovations in eastern Indonesia.

2. ADEQUACY OF PROGRESS IN THE LAST SEMESTER

- a) **Overall progress in operations:** ARISA's model of facilitating engagement between the private sector (PS) and research institutes (RIs) to achieve more rapid uptake of agricultural innovations continues to deliver promising results. All six of the mature interventions are being managed according to plans, and challenges are being proactively managed by the in-country team. There is growing evidence of copying and crowding-in in a number of interventions. However, volatility in market conditions can rapidly affect impact and outreach as we have witnessed in cassava.

The DCED operations are progressing well, noting that the significant workload associated with multiple impact assessments in this Semester has required additional capacity. A pre-audit was conducted August 2018. The auditors provided ten general and 21 specific recommendations and all of these recommendations have been accepted and actioned. The ARISA DCED team continues to work closely with the broader AIP-R results and measurement initiative.

Outreach numbers have increased by over 2,500 in Y17S2 and are essentially on track with projections with Outreach at 4,448 households. Cumulative net income increase (NAIC) has increased significantly from IDR31 billion to IDR144 billion in the last Semester. Ratios of access to use (46%) and use to benefit (77%) are quite high and reflect the influence of RIs in the partnerships. The expected upswing in IPM outreach numbers on the back of extensive social marketing conducted by PRISMA has not occurred., highlighting the challenges of social marketing in more complex systems interventions such as integrated pest management.

There has been significant momentum created in the partnership with Ristekdikti, aided by the appointment of the Liaison Officer, and this has led to an improved operational environment. A PCC meeting was held in November.

- b) **Implementation of interventions:** The six active interventions continued to produce results during Y17S2 (maize & pulses, cassava, beef, sugar, dairy, and shallot IPM). The two new interventions on using local feed ingredients with concentrate feeds to fatten pigs and use of insects to improve pollination in true seed shallots both implemented field studies in the last Semester, with promising early results. It is envisaged these interventions will offer impact opportunities in Phase 2 of AIP-Rural. Given the ongoing market conditions associated with cassava, this intervention has become less active in the last Semester.

One of the main challenges facing the interventions in terms of rapid scaling of outreach relate to markets. Whilst ongoing challenges with cassava and beef prices mean that outreach increase is linear and modest, prices for maize have increased in response to restricted imports and the maize intervention is seeing much greater interest from farmers. Rapid scaling is proving more difficult in the IPM intervention. The social marketing conducted by PRISMA has not led to large scale adoption. This is most likely due to the complex nature of the IPM intervention, where changes to the farming system are required and the trust in using IPM over proven hard chemicals takes time.

- c) **DCED implementation:** Effort in the last six months focussed on the pre-audit in August and in conducting impact assessments. The pre-audit review was conducted in August 2017 to assess the

extent to which ARISA's MRM system complies with the DCED Standard. Recommendations were provided on improving the business models and developing a clear exit strategy; better documenting the key external assumptions; reviewing the detail of the results chain; ensuring indicator boxes are SMART and more clearly defined; improving the collection of qualitative data on behavioural change in the results chain; improving the impact projections; define the timing of data collection more carefully to be more timeous; improve the attribution strategy; strengthening the review meeting process; review the roles and responsibilities in the AIP MRM manual and adapt it for ARISA if necessary; and develop clear roles and responsibilities between ARISA and partner research institutes. All recommendations have now been implemented.

The DCED team conducted five impact assessments in Semester 2. This took considerable effort in organising and conducting surveys. Additional short-term capacity was contracted into the team to assist with processing of field surveys. Yustika Muharastri has overseen the surveys and the processing of data for the MIS and PRIP, which has been a significant achievement.

- d) **Capacity building and innovation systems research:** The main thrust of the capacity building has continued to be the strengthening of the RI-PS partnerships through ongoing mentoring and support by the in-country team members, Rob Caudwell and Teddy Kristedi. The capacity building has also been more strongly linked with the innovation systems research to support the establishment of the intermediation units at UNEJ and UNRAM, as well as developing the capacity of Ristekdikti staff.

The team have deepened their engagement with Ristekdikti, and identified a key opportunity to inform the review of regulations governing intermediation units. This will be a tangible, albeit modest, example of how ARISA is "influencing the influencer" in improving the innovation systems environment. A successful study tour was conducted in December to share insights from Australia and further discussions. There has also been significant progress in the establishment of intermediation offices in UNRAM and UNEJ, with ARISA facilitating strategic planning and design of the units. UNEJ launched their Centre for Intermediation and Industry (CII) in November. Research activities have also progressed, and continue to inform ongoing dialogues with Ristekdikti and ARISA RI partners. The Comparative Advantage study for UNEJ was completed in August, while two case studies are in first draft form, to be revised based on partner input.

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ARISA SEMESTER REPORT: JULY TO DECEMBER 2017

1. BROADER POLICY AND INSTITUTIONAL CONTEXT

Gross expenditure on research and development (R&D) in Indonesia is less than 0.1% of GDP and most R&D is undertaken by public research organizations. Expenditure on R&D in agriculture is proportionately a little higher at 0.27% of gross agricultural output but it is still low by regional and global standards. This modest amount of expenditure on agricultural R&D has not been increasing even though the national budget for agriculture increased by 12% per annum in real terms from 2001 to 2010.

In the 2012 report prepared by the consultancy firm McKinsey¹ they believed boosting agricultural productivity in the smallholder farming sector could be achieved by higher spending on agriculture R&D, accelerated privatization of irrigation systems, greater use of ICT–assisted agricultural extension, improved access to rural finance, more coordinated spatial planning for land use, and accelerated registration and land titling.

Increasing the value of agricultural R&D is closely tied to the broader Science and Technology National Development Goals (2015-2019). The two highest level goals are:

1. Increased R&D product and its application to support:
 - (a) the competitiveness of goods and service sectors;
 - (b) sustainability and utilization of natural resources;
 - (c) preparation of Indonesian society to face the global life.
2. Increased availability of input factors for research, development and application of science and technology that include human resources, infrastructure, institutions, networks, and financing.

2. PROJECT MANAGEMENT AND PROGRESS

2.1 Project Personnel

The in-country team remains unchanged, with Rob Caudwell, Teddy Kristedi, Yustika Muharastri and Suli Hakim operating from the AIP office in Surabaya. Ajeng Astrina, who was contracted for 3 months as the Results Management officer with a focus on Impact Assessments, has now been contracted full time to support the MRM function and the gender mainstreaming activities. With the departure of Lauren Xie, Rob Caudwell is providing day to day supervision of Yustika and Ajeng. Joko Mariyono continues to provide technical assistance for the ARISA-PRISMA intervention in shallot IPM, through a part-time role working from Malang.

Yustika Muharastri has continued to perform outstandingly during the semester. She now leads the in-country results measurement and DECD, and without the support from Lauren Xie, she is working

¹ Oberman, R., Dobbs, R., Budiman, A., Thompson, F., & Rossé, M. (2012). The archipelago economy: Unleashing Indonesia's potential. *McKinsey Global Institute*. Jakarta: McKinsey & Company. <http://www.mckinsey.com/global-themes/asia-pacific/the-archipelago-economy>

closely with Devi Miarni. Ajeng provides support to Yustika in the implementation of the various impact assessments and short surveys for 50% of her time. As she has community development experience, she is now also supporting the research institutions and private sector in the implementation of their gender plans.

Teddy Kristedi continues to use his private sector networks and knowledge to strengthen many of the interventions, especially to improve private sector involvement and engagement. Teddy's involvement in the beef, maize, dairy and cassava interventions has continued to strengthen their relationship with the private sector ensuring long term sustainability. He has also led the initial scoping and start-up of the pig feed intervention in NTT in conjunction with PRISMA.

Monica van Wensveen has joined the team from Canberra. She is responsible for the design and implementation of the communication strategy and has collaborated closely with PRISMA communication staff to align the strategy.

2.2 Project governance

The Team Leader (Andrew Ash) from CSIRO has continued to visit Indonesia regularly to assist with project implementation but just as importantly to maintain good working relationships with Ristekdikti, DFAT management in Jakarta, and the PRISMA, TIRTA and SAFIRA teams in Surabaya. In between visits the Team Leader has regular phone hook-ups with DFAT and senior leaders in AIP-Rural and almost daily interactions with the ARISA team in Surabaya.

A PCC meeting was held in November 2017 in Surabaya. Items covered at the meeting included: general ARISA progress, based on the Semester Report submitted to DFAT in August 2017; implementation plans and discussion on the work program with Ristekdikti on Intermediation Offices and innovation systems; a presentation from Pak Jumain (Director General for Strengthening Innovation) on how Ristekdikti would like to see their engagement with ARISA (and CSIRO more broadly) to develop; progress on the BAST; and, the key outcomes being sought from the Ristekdikti visit to Australia.

Minutes of the PCC meeting are attached in Appendix 1. Dr Wijayanti (Bu Lies), ARISA's Liaison Officer, is working two days per week and she has an office located in the Ristekdikti building. Her role has been important in improving relations between CSIRO and Ristekdikti and in supporting the collaboration between ARISA and Ristekdikti on innovation systems.

2.3 Strategic Review Panel

The Strategic Review Panel met from the 10th to 15th of September 2017. They made several comments and recommendations relating to ARISA, including:

- ARISA interventions perform well but the innovation systems work remains weak – interventions implemented by private sector partners and research institutions under ARISA contributed 3% of incremental AIP-Rural outreach this semester. Leverage (*e.g.* 92% of direct intervention costs) and net attributable income change (*e.g.* farming households earned an additional AUD1.1 million through ARISA interventions this semester) is strong for ARISA interventions.
- The 'concept' that ARISA is tasked with proving is that better public-private collaborations can result in more effective commercial application of research results. The evidence that ARISA generates therefore is not solely about the impact of research on commercial performance and farm productivity. It is also about the 'how to' of establishing more effective collaborations between RIs and the private sector. It will be important for ARISA to capture,

interpret and disseminate these practical lessons during 2018, within Indonesia and more widely. This should include sharing case studies and comparative advantage assessments with DFAT and the wider AIP-Rural team as soon as possible.

- Current efforts to influence the wider research system in Indonesia need to be thought through more carefully, to establish an explicit theory of change: what realistically does ARISA estimate it can influence in the remaining project period, and how might it achieve this? It is acknowledged that ARISA's impact in this regard will not be transformational, but it would be a useful discipline to consider what would constitute reasonable evidence of changed awareness, understanding and practice, resulting from ARISA's efforts in this area? A pragmatic understanding of this influencing process might inform the lesson capture, packaging and dissemination referred to above. The ARISA PRIP for S2Y17 should lead with, and focus on, outputs and early outcomes from the innovation systems work.

The SRP report identified a number of key actions including:

1. DFAT, Palladium and CSIRO should agree wording for partnership and intervention agreements that provide for completion in December 2018 (under arrangements for the current phase) and seamless continuation from January 2019 (under new arrangements but consistent terms for any second phase).
2. ARISA should review the theory of change for its innovation systems research and from that determine what would constitute adequate progress by December 2018, and ensure reasonable evidence is collected to demonstrate progress towards that end. The ARISA PRIP for S2Y17 should lead with, and focus on, outputs and early outcomes from the innovation systems work.
3. SAFIRA, TIRTA and ARISA are not subjected to a DCED Audit in 2018.
4. Resource a purposefully designed program of data and lesson capture, interpretation and dissemination.

How these actions are being addressed is covered in more detail throughout the report but in summary ARISA is addressing the four SRP recommendations in the following manner:

1. High level discussions with Palladium (Tim Stewart) have been held about the potential to continue the most successful interventions into Phase 2. At the CMT Strategic Meeting held in Surabaya in mid-January 2018, there was strong interest in continuing applied research interventions into Phase 2. This led to a broader discussion and interest in the opportunities for applied research in Phase 2 with the PRISMA HOPs identifying a number of opportunities. The transition plan for interventions will be discussed with DFAT in February 2018, after which implementation plans can be put in place in partnership with Palladium.
2. ARISA has reviewed the Theory of Change outlining three impact pathways namely (i) RISTEK's capacity to design, implement and evaluate schemes that support RI-PS collaboration for agricultural innovation is strengthened; (ii) UNRAM and UNEJ organizational structures, policies and incentives encourage researchers to collaborate with the private sector and community sector to apply new and existing research and technology; (iii) Improved capacity of RI intervention teams initiate and manage partnerships effectively with the PS for agricultural innovation. The theory of change has been revised (see Section 8.1 and **Appendix 4**). Progress towards achieving the identified outcomes in the theory of change is described in section 8.1 on the Innovation Systems Research and Capacity building.
3. While ARISA will not undertake a full audit, the MEL team has made significant progress in closing out all recommendations where appropriately and continually improving its MEL systems (see Section 4 and Appendix 2 for further details).

4. Capturing of lessons is progressing through a number of case studies which aim to summarise the detailed chronology of information contained in the innovation practice logs (organisational histories, evolution of the partnerships, key events and challenges etc.) into broader narratives that distil key lessons and insights from the partnerships. To date, first-drafts have been completed for the Maize and Dairy partnerships, revisions will be made to these based on RI-team discussions at the RI workshop (14-15 February). A first draft, for discussion with in-country teams, will be completed for Sugar, Cassava, Beef and IPM by the end of April. Progress on this element is described in more detail in Section 8.5.

3. INTERVENTION PROJECTS

As of 2017 Semester 2, 7 contracts have been signed between ARISA and RIs. 7 ISDs are finalized and a total of 5 Partnership agreements have been jointly developed by ARISA and partners². Discussions are continuing on one further intervention. Progress, opportunities and challenges for the individual interventions are outlined below.

3.1 Beef

Summary of progress

Latest cumulative results

Access:	1,052
Adoption:	758
Benefit (outreach):	488
Projected outreach:	1,000 farming households

Progress

The intervention is still on track and delivering results as planned.

1. The on the ground team continue to facilitate farmers to improve feeding management and to recruit more farmers for the intervention. There are different facilitation strategies for the new and established farmer groups.
 - For the new groups, this involves improving awareness, introduction to cattle feeding using tree legumes, and the development of forage nurseries.
 - For the established groups, this involves strategic feeding based on leaucena, pen improvement, animal health, cattle marketing and linking farmers with banks. Although not formal partners in the project, Bank BRI are looking to strengthen their involvement with the project and UNRAM beyond individual loans to farmers.
2. The on the ground team continue to facilitate farmers to prepare and operate leaucena nurseries to supply planting material for the intervention. This has been done with 19 farmer groups. The team also continue to work with the large traders to promote the production and use of leaucena, with the use of nurseries, on-farm demonstrations, farm visits, and dissemination of best practices in animal husbandry and animal welfare.
3. A research project was undertaken by UNRAM to determine the live weight gain of male Bali cattle using: (a) free grazing, (b) cut, carry and feed of native grasses only, and (c) fattening

² In ARISA, legal contracts are signed with the research institutions which cover deliverables and financing. With each intervention a partnership agreement with all partners is developed to solidify the manner in which they will collaborate together, their roles and responsibilities, values and expectations, contributions, risks and mitigation. This agreement is development is part of best practice for partnerships.

using leaucena. This involved weekly cattle weighing and collection of data on the feeds offered and nutritional variables such as rumen ammonia and VFA concentrations, and blood urea nitrogen. The results from this study are being used to inform the projections on the impact of leaucena fattening on profitability.

4. Small scale pilots have been established to test and demonstrate the advantages of planting improved grass (*Panisetum purpureum*) between leaucena rows, and intercropping maize with leaucena.
5. The Sumbawa Beef Road Map for West Sumbawa was drafted in collaboration with a range of stakeholders from government and private sector.
6. A beef market study was conducted by the UNRAM team, and the two main recommendations from the study are being implemented:
 - Coordinated sale of cattle through collaboration between the on the ground team and large cattle traders, to give economies of scale and improve the bargaining position of the farmers.
 - Exploring a market opportunity to work with traders to commercialise leaucena for the maintenance of cattle weight during transit from farm to market.
7. The ARISA Results Measurement team conducted an updated short survey and impact assessment in Sumbawa and West Sumbawa during October and November.

Challenges

This intervention continues to partner with the large cattle traders and PEPEHANI in Sumbawa, with the low beef prices making it difficult to identify other private sector partners to buy beef at scale. Overall, it has been more difficult for farmers to sell cattle during the semester, due to declining demand both within Sumbawa and from other islands. If this continues it may negatively affect the motivation of farmers to fatten cattle using leaucena, In addition to this, very dry conditions in Sumbawa have made it difficult to find plots close to water to establish leaucena nurseries, plus farmers have often found it difficult to source water for existing nurseries.

3.2 Maize

Summary of progress

Latest cumulative results

Access:	2,628
Adoption:	1,120
Benefit (outreach):	1,108
Projected outreach:	2,200 farming households

Progress

The intervention is on track and is delivering results as planned.

1. Bank NTB are satisfied with the performance of last season's KUR loans to maize farmers in East and North Lombok with 100% of loans being repaid. They are keen to provide loans to a larger number of farmers in these areas for the new season. In addition to this, they are interested to expand the geographical scope of the loans to include two locations in Sumbawa (Labangka and Plampang).
2. Interactions between Bank NTB and the other intervention partners were greatly improved by the involvement of the SAFIRA team. At the local level, interactions between Bank NTB and the farmer have been coordinated and facilitated by the UNRAM team.

3. PT Syngenta want to supply farmers in East and North Lombok, and Sumbawa with maize seed for the new season. They will establish Syngenta Learning Centres and on the ground sales/support teams at these locations.
4. During August, UNRAM and PT Syngenta conducted a series of socialisation events for farmers in East and North Lombok, and Sumbawa in preparation for the new season (19 events for 1,151 farmers). In Sumbawa this also included planning meetings with the Heads of farmer groups, Heads of Dinas and extension officers.
5. UNRAM, PT Syngenta and the local government are collaborating to ensure that the appropriate inputs are available to farmers throughout the new growing season, especially seed and fertiliser. Wherever possible, the NK212 seed will be supplied and used.
6. The local governments in North and East Lombok are very interested in using the Syngenta maize seed and UNRAM innovations tested and commercialised as part of the intervention in their subsidised maize program. This in turn offers opportunities for Syngenta to supply the seed and UNRAM to disseminate the innovations to extension officers and farmers in areas outside the original scope of the intervention. This could significantly increase the outreach of the intervention. Whilst subsidies provide some problems, there is a good opportunity to ensure that they are used to best effect through the involvement of PT Syngenta and UNRAM.
7. A series of Training of Trainer (ToT) courses for have been conducted by the intervention team for Government Extension Officers in North and East Lombok and Sumbawa
8. The UNRAM team interacted with a range other potential partners from the private sector (e.g. CV Sukses Agro Mandiri) relating to the buying and trading of maize, and to give training to farmers in post-harvest technology.
9. The UNRAM team continue to work with local farmers and traders in Bayan, North Lombok for the reproduction of mungbean and groundnut seeds. This is being expanded to include Labangka, Sumbawa. These farmers will get certified as local seed producers and it will be a new business opportunity for them. UNRAM are interacting with the Seed Monitoring and Certification Centre (BPSB, NTB) about this process.
10. UNRAM, PT Syngenta and Bank NTB worked with the Head of farmer groups to explore the possibility for these leaders to be local agents for the sale and distribution of Syngenta seeds and other products. Also for these leaders to be the focal point for the various administrative requirements needed by Bank NTB for the distribution of KUR loans to farmers.
11. The ARISA Results Measurement team conducted an updated short survey and impact assessment in East and North Lombok during August, along with a baseline for the new locations in Sumbawa in November.

Challenges

There have been changes to the maize market system during the semester resulting from the provision and expansion of maize subsidies, and limitations on maize imports by the Government of Indonesia. Overall, this is expected to have a positive impact on production and prices during the new season, but it may result in shortages in the availability of appropriate seeds and the required fertiliser inputs, as demand is so high due to the subsidies. For example, the availability of the drought tolerant seed from Syngenta (NK 212) has been limited, and Syngenta has offered its new premium variety (NK 7328) as an alternative. This seed has higher yield potential, but is less drought tolerant than NK 212.

3.3 Cassava

Summary of progress

Latest cumulative results

Access:	1,297
Adoption:	445
Benefit (outreach):	416
Projected outreach:	800 farming households

Challenges

The issues in the cassava market system have continued through the semester, with the influx of cheap cassava from Thailand challenging the production side of the business model. Prices for raw cassava have declined to IDR 500 per kilogram in many areas. PT BCM discontinued the purchase of MOCAF chips from the processing clusters, the clusters have been mostly inactive and, in most cases, farmers have not yet harvested their cassava planted last year.

However, in the longer term, the production of cassava still presents opportunities for farmers in Indonesia, particularly for those in marginal areas that are linked to the MOCAF processing clusters. Prices will not stay low indefinitely and PT BCM has already indicated that they will start to purchase MOCAF chips again in January 2018. We are cautiously optimistic that the situation will improve during 2018 and beyond.

Progress

Due to the above challenges, the intervention will not deliver outreach as planned when the cassava prices were higher. More limited progress is expected and outreach numbers will be revised downwards. This will be compensated for by better than expected progress in other interventions.

1. The renewed demand for MOCAF chips by PT BCM will mean that there is a market for the cassava currently in the ground around Jember and Lumajang. It is expected that most of this crop will be harvested in the next two months.
2. The processing cluster in the Jember and Lumajang areas are already operational to produce unfermented cassava chips at a limited scale, which are purchased by PT BCM at a lower price than MOCAF chips. The clusters have also started to sell small quantities of dried cassava chips as feed to duck farmers. These business activities give an income stream to the local entrepreneurs who have invested in the clusters, plus a market opportunity for cassava farmers.
3. Halal certification has been achieved for MOCAF processing.
4. The fertiliser trial is still in process and will be harvested later in the year or early next year. This will include data about the efficacy of the products sold by the companies previously involved in the PRISMA interventions on cassava (e.g. PT Nasa).
5. The intervention team successfully scoped out a new business opportunity for Tape cassava around Bondowoso. This has the support of several SMEs involved in Tape production, as well as the local government. A viable business plan has been developed.
6. Demonstration sites were established for Tape cassava and training events will be conducted at these locations around Bondowoso.
7. Technical assistance has been provided for MOCAF and Tape cassava by a plant nutrition expert from CSIRO, Dr Mike Webb.
8. The ARISA Results Measurement team will conduct an updated short survey and impact assessment in Jember and Lumajang in early 2018, as well as a baseline for the new locations for Tape cassava in Bondowoso.

3.4 Shallot IPM

Summary of progress

Latest cumulative results

Access:	2,628
Adoption:	1,171
Benefit (outreach):	908
Projected outreach:	2,650 farming households

Progress

The intervention is on track and is delivering results as planned.

1. The Bt product from PT NuFarm continues to be a major component of the IPM system for dry season shallots. Shallot farmers are very keen to buy and use this product, and this gives a significant market opportunity for PT NuFarm. PT NuFarm are selling the product in other geographical locations and for IPM on other crops.
2. PT NuFarm have co-invested in large number of demonstration sites in Probolinggo, Pare and Nganjuk for the promotion of IPM for dry season shallot production.
3. PT NuFarm continue to invest in and expand there on the ground teams for the sale of the Bt product and to provide technical advice to farmers in these areas.
4. Several social marketing events were held in the intervention areas by PRISMA, in collaboration with CropLife, local government and a range of input suppliers, including PT NuFarm. These are large events with information about pesticide stewardship, integrated pest and disease management, and a range of good agricultural practices. Similar social marketing events have also been held for shallot farmers in East Lombok, Bima and Sumbawa.
5. The University of Gadjah Mada (UGM) and PT Solbi completed the testing of pheromone traps for the management of *Spodoptera exigua*. The conclusion was that the most appropriate use of the pheromone traps is for pest monitoring and IPM decision making by farmers. This offers a market opportunity for PT Solbi to sell its product.
6. The ARISA Results Measurement team conducted an updated short survey and impact assessment in East Java during July, with a follow up survey conducted in November.

Challenges

There have been no major challenges in this intervention during the semester. The shallot market system remains attractive for farmers, demand is strong and prices are high. The weather has been suitable for dry season production, and farmers are able to manage insect pests using the IPM innovations tested and developed as part of the intervention.

3.5 Sugar

Summary of progress

Latest cumulative results

Access:	1,534 farming households
Adoption:	143 farming households
Benefit (outreach):	Not yet measured
Projected outreach:	700 farming households

Challenges

PTPN X provides supply contracts, support with inputs, and a guaranteed market linkage with price premium for sugarcane farmers in Madura. Their network of extension officers provide training and technical backstopping. However, the operating environment in Madura remains difficult and the company are reluctant to invest in a processing mill on the island. Furthermore, as a state owned enterprise, the company has been slightly difficult to partner with for the intervention, especially relating to the mechanism for administrating the system of supply contracts with lead farmers.

The intervention continues to partner with PTPN X, but during the semester a new partnership has been established with a small company that produces unrefined brown sugar from cane grown in Pamekasan and Sumenep Districts, PT GMM. This company has a small processing facility on the north coast of Madura and interacts with individual farmers directly, rather than via lead farmers. It has established relationships with 200-300 farmers, and is keen to expand its operations. The company supplies unrefined brown sugar to the food processing industry in Surabaya, for the production of tomato sauce and soya sauce.

Progress

Due to the challenges of working with PTPN X, and the long crop cycle of sugarcane, it is not expected the intervention will deliver the original planned outreach of over 1000. More limited progress is expected and outreach numbers have been revised downwards.

1. PTPN X and ISRI continue to implement two large demonstration sites in Pamekasan District, for rain-fed and irrigation sugarcane. These sites were harvested during the semester, giving very promising results in terms of yield and sugar content. The sugarcane has been ratooned and the demonstration sites will continue to be used for applied research and training during the new season.
2. PTPN X and ISRI established a large demonstration site for rain-fed sugarcane in Bangkalan District. This site will also be used for applied research and training during the new season. A deep tube well has been installed and there are plans to include a demonstration for irrigated sugarcane at the same location.
3. PT GMM and ISRI conducted a series of training events for new sugarcane farmers in Pamekasan and Sumenep Districts. More than 400 farmers attended these events. Demonstration sites have also been established in the PT GMM company locations.
4. PT GMM will provide support for these new sugarcane farmers, including assistance with land preparation, fertiliser inputs, promotion of good agricultural practices, and harvesting. They will also provide a guaranteed market linkage for unrefined brown sugar.
5. PT GMM and ISRI conducted a series of activities for women's economic empowerment, especially for the small scale production of brown sugar at the household level. PT GMM are very supportive of this, and will provide a market linkage for the product. 100 women have participated in this socialisation and training.
6. The ARISA Results Measurement team conducted a short survey and impact assessment in Madura during December 2017. Additional data will be collected for this in February 2018.

3.6 Dairy

Summary of progress

Latest cumulative results

Access:	3,210
Adoption:	2,135
Benefit (outreach):	1,522
Projected outreach:	2,550 farming households

Progress

The intervention is on track and is delivering results as planned.

1. PT Nestle provided the first loan for fodder business development to the dairy cooperative in Semen. This Rp 200 million loan, with a grace period of six months, will help the cooperative to start up a new fodder business, growing odot on about 2 ha of land and selling it to other dairy farmers in the local area. Technical assistance will be provided by PT Nestle and the UB team.
2. PT Nestle continue to promote a range of good animal husbandry practices, through the provision of appropriate inputs and equipment, along with a programme of training and extension for their milk suppliers at the dairy cooperatives. This includes cow carpets, water ad libitum, feed choppers, milking machines and churns, calf milk replacer, hoof trimming, and slurry treatment.
3. The UB team continued to establish demonstration sites for a range of fodder plants, including moringa, odot, indigofera, brachiaria, lablab and leaucena, focused in open fields rather than under shade. Some of these sites also include small-scale trials to determine optimal fertiliser treatments for the fodder plants.
4. PT Nestle and UB conducted a series of training courses in financial management to the members of the dairy cooperatives at Ngantang and Karang Ploso.
5. The UB team conducted applied research on the potential of indigofera as a fodder source. From the research it is expected that one hectare of indigofera, planted at 1 x 1 m, will yield approximately 34.5 ton of fresh fodder (equal to 7 ton dry matter/ha/harvest). Indigofera can be harvested every 90 days, it is therefore likely that yield may be up to 28 ton dry matter/ha/year. Indigofera nurseries have been established at the dairy cooperatives.
6. A market study was conducted by the UB team, looking at the role of fodder traders in the dairy market system, especially for odot and other promising types of fodder.
7. The ARISA Results Measurement team conducted a short survey and impact assessment for dairy around Malang during October and November.

Challenges

The main challenge during the semester related to the partnership between PT Nestle and University of Brawijaya (UB), especially the level of collaboration between the two partners in the intervention. This has required proactive management by ARISA, led by Teddy Kristedi. In addition to this, there have been issues with the level of human resources allocated to intervention by the UB team. Overall, both of these issues have been successfully managed by ARISA and are not impeding the implementation of the intervention.

Another challenge has been the mindset of dairy farmers towards using odot grass as compared with other fodder such as maize stover and elephant grass, with farmers more focused on fodder quantity rather than quality. Many farmers are not accustomed to cutting odot at the optimum age for quantity and protein content (40 - 60 days) because at this age the height of odot is shorter than other fodder. Consequently, odot is often cut at more than 80 days, with a resulting reduction in protein content.

However, farmers realise that using odot will significantly increase milk yields and the PT Nestle and UB teams are working with them to improve the cultivation, especially relating to appropriate harvesting intervals.

3.7 Pig feed

Summary of progress

Latest cumulative results

Access:	0
Adoption:	0
Benefit (outreach):	0
Projected outreach:	200 farming households

This smaller intervention started up during the semester. It is partnership between PT Sierad and the University of Nusa Cendana (UNDANA) in Kupang, and linked to the PRISMA interventions in pigs. The intervention responds to the need identified by PT Sierad and the PRISMA team regarding the importance to better understand the feasibility, seasonal availability and nutritional content of local feed that has been traditionally used by many pig farmers in NTT.

PT Sierad expressed a desire to explore ways to optimize the use of local feed ingredients to complement their commercially available concentrate feeds. The aim being to increase local farmers' access to quality feed at a lower price, by combining the use of local ingredients with concentrate feeds. If successful, the farmers will have access to custom-made feed concentrate that will be developed by PT Sierad to fit with locally available feed ingredients in NTT.

During the semester feeding trials have been established by UNDANA and PT Sierad in Kupang to test a range of local feed ingredients, together with commercial feed mixes and concentrates from the company. The local ingredients include tamarind seeds, cassava, pumpkin and putak. The trials are underway with strong support from the company, and should be completed by February or March 2018.

The next step after the feeding trials, if any of the local feed ingredients formula are proven to be feasible and fit with local market characteristics, is to scale them out using the demonstration sites and input suppliers that are already working with PT Sierad through PRISMA. This could start in the first semester next year.

3.8 True Seed Shallots

Summary of progress

This smaller intervention started up during the semester. It is a partnership between PT EWINDO and Bandung Institute of Technology (ITB), and linked to the PRISMA intervention for the production of true seed shallots (TSS)

Until now, farmers in Indonesia usually use bulbs as seed for producing shallots. However, the use of bulbs has several disadvantages, such as uncertain and unstable quality, vulnerability to disease, and high demand, which significantly increases production costs. Overall, bulbs are very expensive for smallholder farmers to purchase, which in turn limits their use. PT Ewindo is one of the companies trying to commercialise the use of TSS in Indonesia. However, a major constraint to TSS production is pollination of the shallots in the nursery, which usually has to be done by hand.

This intervention therefore aims to improve pollination for TSS production, by testing and developing a range of insects, including several species of bees and flies. Applied research has been conducted during the semester to test the efficiency of various types of insects as pollinators, and how they can be mass produced and used within the production system. This work will continue in 2018, with technical assistance to be provided by expert in insect pollination from Australia (Dr Tim Heard).

4. DCED, MONITORING, EVALUATION AND LEARNING

Yustika Muharastri has done an excellent job in managing the monitoring, evaluation and learning following Lauren Xie's departure in July. Lauren continued to provide minor support remotely mainly for the preparation of the DCED pre-audit in August/September. Ajeng Astrina was brought into the Results and Measurement function in April to assist Yustika in managing field data collection and surveys. She has continued to undertake this function and has supported the infield activities well. From December, as the back log of impact assessments has completed, 50% of Ajeng's time has been allocated to gender activities.

The pre-audit review was conducted from the 28th-29th of August 2017 to assess the extent to which ARISA's MRM system complies with the DCED Standard Version VIII. Apart from the costing system, all control points and compliance criteria were checked for "system in use". The assessment relied on a document review and interviews with ARISA's staff and managers, as well as with staff members from partner research institutes. ARISA selected 3 interventions out of 6 on-going interventions to be covered in the pre-audit review which were:

- Best practice for dual cropping models using new superior maize hybrid varieties with pulses (mung bean and ground nut) on drylands in NTB.
- Developing profitable and sustainable beef production systems in Sumbawa through engagement of cattle farmers with private beef enterprise.
- Integrated pest management for smallholder shallot farmers in East Java.

The consultants reviewed the relevant documents for the selected interventions and the documents for the program level. The consultants interviewed the intervention manager, MEL manager, MEL office, staff from partner research institutes, financial manager and the team leader. Findings and recommendations were then presented and discussed with to the in-country team on September 4th, 2017.

Ten general recommendations were provided on improving the business models and developing a clear exit strategy; better documenting the key external assumptions; reviewing the detail of the results chain; ensuring indicator boxes are SMART and more clearly defined; improving the collection of qualitative data on behavioural change in the results chain; improving the impact projections; define the timing of data collection more carefully to be more timeous; improve the attribution strategy; strengthening the review meeting process; review the roles and responsibilities in the AIP MRM manual and adapt it for ARISA if necessary; and develop clear roles and responsibilities between ARISA and partner research institutes.

The general recommendations were condensed into the 21 specific recommendations. The ARISA team assigned one person to address each of these recommendations, and work commenced in September. Some of the recommendations have already been addressed, whilst some are on-going, and others will be dealt with in the first semester of 2018. The status of each recommendations is given in *Appendix 2*. While the SRP recommended that ARISA, with SAFIRA and TIRTA will not need to undertake a full audit, ARISA will continue to refine and improve its monitoring systems as per the pre-audit.

ARISA continues to work closely with the broader AIP-Rural Results and Measurement function, and in particular has formed a good working relationship with Devi Miarni, who is providing ongoing guidance on processes and data going into the MIS/PMT. Significant effort went into preparing for the joint DCED pre-audit with SAFIRA and TIRTA, and improving the consistency of processes and methods in results measurement when possible with those used by Palladium in the other three projects, primarily through Devi. There have been a number of challenges with implementing DCED, as data collection methods during initial baselines differed between ARISA and the other projects, and unpredictable and changing circumstances in the field have required repeated retrospective data collection to meet evolving data needs, including those arising from updated attribution methods. The backlog of data collection has now been completed. In this semester, two baseline surveys were undertaken for IPM and maize. Five impact assessment surveys were conducted for beef, dairy, IPM, maize and sugarcane.

Overall the coordination with the results measurement and intervention staff in PRISMA and SAFIRA on joint interventions has continued to improve to ensure consistency in impact measurement and approaches.

The latest values for key indicators associated with ARISA KPIs is shown in Table 1 and AIP-Rural relevant indicators are shown in

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Table 2. ARISA also has key indicators relating to Innovation and these are shown in *Appendix 1*.

Results from the evaluation of the interventions show that adoption and access is ramping up with over 12,428 (cumulative) households accessing information on interventions and 5,772 (cumulative) now adopting new practices in the interventions, with showing the Access, Use and Outreach per intervention. Access to Use ratio is 46% and Use to Benefit is 77%. Both of these conversion percentages are reasonably high and may reflect in part the involvement of the Research Institutes in interventions and the trust and confidence they can provide in farmers taking on new technologies.

Outreach numbers are increasing and are at 4,448 households, an increase of 2,588 households in the last Semester (see Tables 3 and 4). The projected and trajectory outreach numbers are shown in Figure 1. Cumulative net income increase (NAIC) has increased by IDR 31 billion to IDR 128 billion. Turnover by ISPs/SMEs has increased over four fold in the last semester to IDR 24 billion.

At this stage ARISA is still largely on track to achieving a target of 10,000, based on the projection curve. However, from Y17S2 there is a significant upward increase in outreach associated with the assumed “S-curve” of accelerating adoption and outreach. We are reasonably confident about more rapid expansion in adoption in maize and IPM. As indicated in the intervention section, cassava adoption numbers are likely to increase linearly and at a modest rate because of the current market conditions. In beef, there is an 18-24 month lag between intervention establishment i.e. planting leucaena and turning off fattened animals. Consequently, beef numbers are envisaged to grow steadily (in line with projections) but not accelerate exponentially within this phase of AIP-Rural. Similarly, sugar cane production has a long lag time between establishment and realisation of impact so it is expected that increases in adoption and outreach will be linear though until 2018.

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Table 1: ARISA KPIs as of 31st December, 2017.

ARISA KPIs				
ID	Indicator	Value (additional, in Y17S2)	Value cumulative	Remarks
KPI 1a	Changes in “innovation capacity” of research institute intervention teams	2.5	7.5	See Appendix 3
KPI 1b	Changes in “innovation capacity” of research institute faculties	6	9	See Appendix 3
KPI 2	Progress towards establishing policy dialogue mechanism to engage at the RI-PS interface			See Appendix 3
KPI 3	Net additional and attributable income changes of farmer HH using project-supported innovation (impact), IDR	2,588	4,448	
KPI 4	Number of farming households who have adopted the project innovation (use)	2,671	5,772	
KPI 5	Number of farming households who have been exposed to the project innovation (access)	2,914	12,428	

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Table 2: ARISA contribution to AIP-Rural KPIs.

AIP-Rural KPIs				
	Indicator	Value (additional, in Y17S2)	Value cumulative	Remarks
KPI 1	Number of farm households with increased net incomes (same as actual outreach)	2,588	4,448	
KPI 1a	Number of farm households under \$2.00PP poverty line with increased net incomes	609	1,193	
KPI 1b	Number of farm households under \$2.50PP poverty line with increased net incomes	1,427	2,024	
KPI 2	Net attributable income increases of all of farm households IDR	97,172,018,075	128,479,973,590	
KPI 2a	Net attributable income increases of all of farm households under \$2.00PP poverty line IDR	22,970,716,432	33,850,048,539	
KPI 2b	Net attributable income increases of all of farm households under \$2.50PP poverty line IDR	48,429,966,554	53,689,427,242	
KPI 3	Number of ISPs or SMEs with increased turnover	30	62	
KPI 4	Value of additional turnover of ISPs or SMEs in IDR	5,944,720,000	24,676,555,000	
KPI 5	Number of innovations introduced by private sector	-	7	
KPI 6	Number of initiatives taken by government to improve BEE.	1	2	
KPI 7	Number of intervention partners (public sector and private sector)	5	16	ARISA has 5 other intervention partners with which it works without a MoU or partnership agreement including Nestle, UNDANA, ITB, PT Sierad, EWINDO.
KPI 8	Value of investment by private sector partners (incl. ISPs/ SMEs) in IDR	5,050,618,759	12,031,304,759	
KPI 8a	Value of investment of research institutions	1,071,513,727	3,783,943,340	

Table 3: Access, Use Outreach numbers for Semester 2, 2017 against planned, per intervention

FARM HOUSEHOLDS	# HHs Access		# HHs Use		# HHs Outreach				Individual: HH ratio	Proportion of female farmers ³
	Interventions	Y17S2	Cumulative	Y17S2	Cumulative	Planned Y17S2	Y17S2	Cumulative		
Beef	314	1052	281	758		170	488	1000	1.82	0.314
Maize Mungbean	1,999	2,628	745	1,120		790	1,108	2,200	2.72	0.475
Cassava	107	1,297	14	445		-	416	800	1.44	0.154
Sheep	0	79	0	9		0	6	9	1.6	0.286
Sugarcane	504	1,534	24	143		0	0	700	1.2	0.125
Dairy	- 179	3,210	1,943	2,135		1,522	1,522	2,550	2.3	0.429
IPM	169	2,628	-336	1,171		106	908	2,650	2.16	0.387
Pigs								200	not yet measured	not yet measured
Total		12,428		5,781			4,448	10,106		

³ This ratio is based on the methodology used by PRISMA to calculate the ratio of women in a household in a sector. It is unlikely that all of women in a household would adopt a technology and therefore any calculations using ratios are likely to over-estimate the number of women engaged in the intervention.

Table 4: Outreach numbers for all semesters to date, and projections until end of project

Sector	Intervention Start	Cumulative Plan	Cumulative Actual	Y1552 Plan	Y1552 Actual	Y1651 Plan	Y1651 Actual	Y1652 Plan	Y1652 Actual	Y1751 Plan	Y1751 Actual	Y1752 Plan	Y1752 Actual	Y1851 Plan	Y1851 Actual	Y1852 Plan	Y1852 Actual
Beef	Y1552	1,000	488	0	0	0	0	0	0	350	318	300	170	200		312	
Maize & pulses	Y1552	2,200	1,108	0	0	35	42	0	8	245	268	0	790	892		200	
Cassava	Y1552	800	416	0	0	0	0	240	240	0	176	140	0	234		150	
Sheep	Y1552	6	6	0	0	0	0	9	5	0	1	0	0	0		0	
Sugarcane	Y1651	700	0	0	0	0	0	0	0	0	0	169	0	325		375	
Dairy	Y1651	2,550	1,522	0	0	0	0	0	0	0	0	956	1,522	358		670	
IPM (combined ARISA & PRISMA)	Y1552	2,650	908	2	6	50	51	245	532	56	213	1,852	106	692		1050	
Pigs (combined ARISA & PRISMA)	Pipeline	200	0	0	0	0	0	0	0	0	0	0	0	0		200	
Total		10,106	4,448	2	6	85	93	494	785	651	976	3,417	2,588	2,701	0	2,957	0

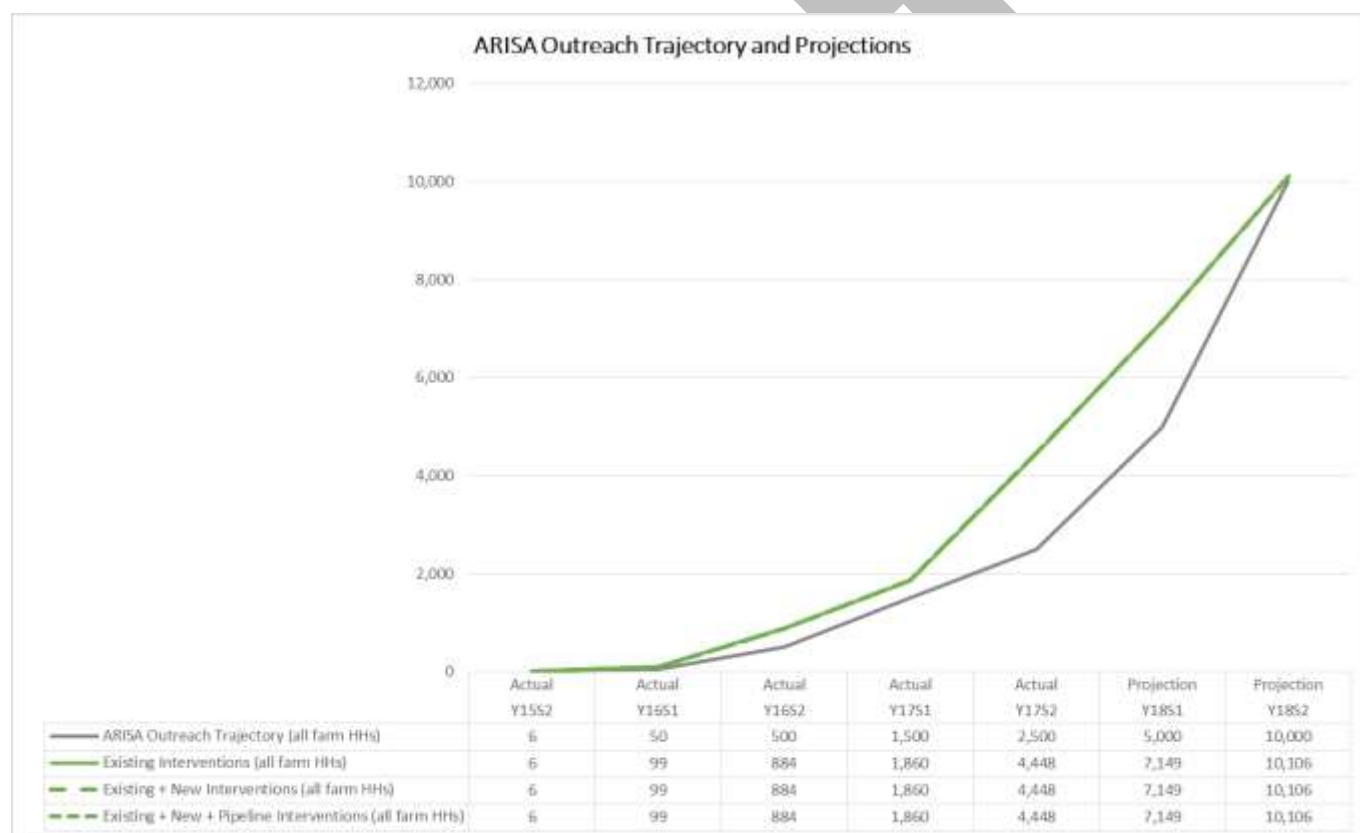


Figure 1. ARISA Outreach Trajectory and Projections

5. COMMUNICATION

A stakeholder engagement plan was drafted in December 2017 and has been shared with the AIP-Rural communication team. The ARISA plan dovetails the AIP-Rural Communication Strategy (January 2017 revision) and supports the new emphasis on articulating impact and achievements through the lens of the people and agencies related to AIP-Rural.

Accordingly, the new ARISA workplan supports the development and implementation of the AIP-Rural Info-Card series and a schedule for ARISA input has been agreed with the AIP-Rural communication team. In the second semester of 2017, six Info-Cards were drafted, including one on the comparative analysis study, as requested by the SRP.

Where ARISA's priority stakeholders diverge from other components of AIP-Rural (for example, Ristekdikti, the research community and CSIRO are key stakeholders for ARISA), additional mechanisms for engagement will be employed or developed (for example, use of CSIRO web presences and social media channels, research publications and seminars and specific briefings are anticipated). Relevant information will be shared with the AIP-Rural communication team.

Additional communication activity in Semester 2 included:

- Andrew Ash gave a plenary presentation at the 5th International Seminar Of Animal Nutrition & Feed Science, held in Lombok in November, 2017
- Andrew Ash gave a keynote presentation at the World Plantation Conference, held in Jakarta in October
- Michaela presented on Building Partnerships for Food Security and Sustainable Agriculture in the face of Climate Change at the FoSSA Conference, 2nd August, 2017.
- Andrew Hall presented on Agricultural Innovation Systems in Indonesia at The Indonesia Development Forum (IDF), 9th to 10th August, 2017
- Three CSIRO Twitter references (Ristekdikti visit to Australia in December 2017, and one each on ARISA's dairy and IPM shallots interventions, following a trip to Indonesian in October 2017) and one iXc Twitter reference (Ristekdikti meeting in December 2017).

6. CAPACITY BUILDING

In the last 6 months, the capacity building continued to **consolidate and reframe the partnerships** where required. The Intervention Manager (Teddy) and Country Project Manager (Rob) have continued to play a strategic role in this reshaping and capacity building, acting as mentors, as it requires regular ongoing input and support. They have also played a key role with dairy in the identification and engagement of fodder traders, creating linkages to the project and consolidating the relationship between UB and Nestle with possibility to extend the work across many dairy cooperatives in East Java. In addition, they have supported the UNRAM maize intervention team in their engagement with Bank NTB. All of this is part of the wider capacity building to develop skills which can result in systemic change in the specific value chains.

A second thrust of the capacity building has been the strong focus on shifting the **RI focus from research to identifying mechanisms to ensure they are more outward looking**, able to engage with the private sector and commercialise their work. The project efforts have largely been focused on supporting UNEJ and UNRAM as they initiate the establishment of their intermediation units. (See Section 8.1 for further details).

The third prong has been the engagement with RISTEK around best practice to stimulate innovation. The main capacity building occurred during the Ristekdikti visit to Canberra and Brisbane in December 2017. (See Section 8.2 for further details)

The fourth prong of capacity building has been with Ristekdikti on developing a **MEL system** for the intermediation units, with a pilot focused on UNEJ. Training has occurred in February and April 2017. This is described in more detail in Section 8.2 on innovation systems research.

The fifth prong of capacity building has been specific **technical support** for partnerships by Australian researchers. Technical assistance has been provided for MOCAF and Tape cassava by a plant nutrition expert from CSIRO, Dr Mike Webb.

In the next semester the focus of the capacity building will be largely on the creating the capacity for the Intermediation Units at UNEJ and UNRAM to be sustainable; supporting RISTEK's capability development to support other RIs establish intermediation units; capturing lessons learnt from the interventions and partnering with the private sector. In addition the focus will be on the implementation of the MEL system at UNEJ in collaboration with Ristekdikti.

7. GENDER

Over the last semester, after interactions with the PRSIMA gender team and consultant Holly Krueger, it became increasingly clear that additional support was required in Indonesia to effectively mainstream the gender initiatives in the interventions. As a result Ajeng's time on MEL has been reduced and half her time is now allocated to gender. Ajeng brings with her extensive experience of working in communities and gender implementation.

In December, Michaela Cosijn, and women's economic empowerment specialist and Ajeng redefined the gender plan to have the highest impact. The focus will be on maize, IPM and potentially tape which already have high levels of female engagement and businesses such as Syngenta and Bank NTB which are committed to working with women. Beef and dairy will have less priority but lessons learnt on how to better engage women in male dominated value chains will be collected. In addition ARISA will more closely align its gender work with PRISMA and SAFIRA where possible.

In the maize intervention, which is dominated by women, the focus has continued to be on ensuring women have access to technical support on growing maize and mungbean, as well as applied bookkeeping. In socialisations which occurred in June, more women than men attended. Syngenta has continued to actively support the training of women and sees women as a market for seeds. With PRISMA, ARISA is investigating whether in future Syngenta will sell seeds on credit, focusing on providing women with increased access. The UNRAM team and SAFIRA have worked closely with Bank NTB to provide loans to women. 708 loans have been issued with 231 going to women (32%). In East Lombok the loan uptake by women was 48%, compared to 20% in North Lombok.

In the IPM practices, the role of female farmers is significant, particularly in conducting mechanical or cultural measures. This role is undertaken simultaneously with weeding. About 50% of farming activities in shallot cultivation are conducted by women. However, the proportion of female farmers in demonstration trials still continues to be very low although PRISMA social marketing events where the private sector is present is showing promise. Several social marketing events were held in collaboration with CropLife, local government and a range of input suppliers, including PT NuFarm. These are large events with information about pesticide stewardship, integrated pest and disease management, and a range of good agricultural practices. Similar social marketing events have also been held for shallot farmers in East Lombok, Bima and Sumbawa. Women are specifically targeted for

invite to these events. In addition, for IPM, ARISA will explore opportunities to improve post production value of shallots (i.e. drying and storage) which only women are involved in.

In November ISRI and PT GMM trained 100 Madurese women on how to process cane into brown sugar, which can be done at a household level. This brown sugar is then sold to markets in Surabaya. It is anticipated that this will benefit women. As the availability of sugarcane has been low, women have not yet started to sell in any large quantities. An assessment of the benefit and impact of the training will be done in early 2018.

In cassava 230 jobs were created in the clusters, MOCAF outlets and coops, the majority of which women engage in. However, due to the low price of cassava these cooperatives are largely not active at present. UNEJ continues to focus on the capacity building in baking of food for the coop outlets. In addition opportunities are being investigated to work with women in improving tape production.

In both dairy and beef it has been difficult to gain traction for the inclusion of women in these male dominated value chains, even though women are involved in much of the animal caring and rearing. In 2018, ARISA will re-examine potential options.

Pigs are largely reared by women. Therefore the improvement of feed practices has the potential to benefit women. ARISA is working closely with the PRISMA team on this intervention and will take their lead on how to proceed with any gender interventions.

8. INNOVATION SYSTEMS AND RELATED CAPACITY BUILDING

There has been significant progress and increasing momentum in the innovation systems research and capacity building activities in the last reporting period, particularly in terms of the partnership with RISTEKDKITI and establishment of intermediation offices in UNEJ and UNRAM.

8.1 Revised Theory of Change relating to institutional change outcomes of ARISA

In response to concerns raised at the S1Y17 SRP, a revised theory of change was developed that focuses on the ARISA objective to foster *increased capacity of research institutes and private-sector to partners for smallholder-relevant innovation* (Figure 2, see also **Appendix 4** for a more in-depth explanation). This was a timely exercise given the increasing clarity of focus in the partnership with Ristekdikti around intermediation offices and the emergent opportunity to influence the revision of Ristekdikti regulations and guidance to universities on intermediation offices.

ARISA activities that contribute to increased capacity in three key activity areas:

- (a) The **partnership with Ristekdikti** aims to support increased capability in design of programs to support RI-PS collaboration. Activities are designed to foster interactive learning, such as study tours to provide key staff with an opportunity to question, and learn from, the experience of Australian Universities and governments in RI-PS collaboration schemes, as well as the experiences of Indonesian Universities who have established and successful intermediation units. The partnership also provides a foundation to share insights from other ARISA activities (e.g. case studies, comparative advantage, establishment of intermediation offices) with key actors within Ristekdikti, and in particular the Directorate of Industry and Innovation. Insights will be summarised into a set of guidelines for designing, establishing, and reviewing RI-based intermediation units, which in turn will be used in Ristekdikti's review of regulations for Intermediation Offices. By informing the review of regulations in this way, it is expected that the enabling environment that supports universities wishing to become more private-sector facing will be improved. Section 8.2 provides more detail on the progress of this engagement in Y17S2.

- (b) The **establishment of intermediation offices within UNEJ and UNRAM** aims to support the universities to establish some key structures, policies and organisational incentives to encourage researchers to engage with the private sector. ARISA's support to the two universities in strategic planning and design of these units has encouraged feasible and realistic plans. The establishment of the Intermediation units provides a critical point of support within the universities to formalise mechanisms of engagement and support a more strategic engagement with the private sector that is sustained beyond ARISA. This will not prohibit individual researchers who already engage in partnerships from doing so, but importantly provides resources and capabilities within the university to expand on these existing partnerships, and support researchers without links to the private sector to build these links. Section 8.3 provides more detail on the progress of this engagement in Y17S2.
- (c) **Building RI team capacity** aims to provide the skills and confidence for RI Teams involved in ARISA to expand collaborations with the private sector into the future. This helps to build a pool of researchers within the universities that have skills and experience in private sector partnerships, but also aims to extend researchers' strategic thinking in terms of how to pitch to the private sector, how to manage and negotiation partnerships and so on.

Points for reflection, sharing of insights and learning are woven throughout these capacity building activities and are also overlap with 'formal' research activities. Monitoring of the partnerships and formal research activities (practice logs, case studies and analysis) document and analyse the mixed and varied processes of research-private sector partnerships in the interventions to draw out broader insights relating to opportunities, challenges, risks and the dynamics of partnering; and more generally the lessons learned from the grants process that ARISA followed. These lessons, insights and challenges are discussed at the annual RI workshops, and inform discussions with Ristekdikti, UNEJ and UNRAM as part of other areas outlined above.

8.2 Partnership with Ristekdikti to support capability in program design

This semester has seen significant progress in the partnership with Ristekdikti, which centres on programs relating to the establishment of intermediation offices within Indonesian universities. Formal capacity building activities, such as the study-tour to Australia, have been complemented by the opportunity to share insights from other ARISA activities, in particular the experiences of UNEJ in establishing their own intermediation unit.

In October, the ARISA team met with Mr Santosa Warsono, Director of Industry Innovation, Ristekdikti, to share UNEJ progress and preliminary experience in establishing an intermediation office. The discussion emphasised that, although many of the challenges within the Indonesian innovation system are not unique, the context of innovation Indonesia is. Activities with Ristekdikti have therefore focused on what can be learned from models for research-industry collaboration in Australia, and what can be learned from existing schemes for Intermediation Offices in Indonesia.

In December, three senior Ristekdikti staff, including the Director of Industry Innovation and the Director of Innovation Systems, visited Brisbane and Canberra to learn about Australian models for technology transfer and intermediation offices; policies and programs for innovation at the University of Queensland; Australian National University; Department of Jobs and Innovation (former Department of Industry, Innovation and Science); Department of Agriculture and Water Resources; and DFAT innovation exchange. In addition, the participants were able to learn about research-institute programs to build internal capacity to pitch to, and work with, the private sector, such as CSIRO's ON Program.

Debrief and reflection with participants at the end of the study tour indicated the visit had contributed to greater insight into the potential options to foster RI-PS engagement, and some of the system-level requirements, such as breaking down Ministerial silos, rethinking university incentive systems, and supporting the skills and capabilities within the system required to foster innovation. Importantly, participants articulated a need to shift their thinking

and processes, for example, to consider likely impacts, rather than just outputs, when considering grant applications. Mr Warsono specifically referenced his experience with ARISA as contributing to this shift in thinking which is now translating to a phase of planning and implementation within Ristekdikti

To build on this experience, a study tour of established intermediation offices at the Bandung Institute of Technology (ITB), Bogor Agricultural University (IPB), University of Gadjah Mada (UGM) and University of Brawijaya (UB) will be conducted in February. The tour will include representatives from Ristekdikti, as well as teams involved in establishing intermediation offices at UNEJ and UNRAM. As such, the tour provides a unique opportunity to bring together government officers tasked with the design and regulation of programs, universities with experience in implementation, and universities at the start of their intermediation office process.

The lessons and insights from these tours and discussions with Ristekdikti will inform the development of guidelines for establishing, designing, monitoring and evaluating intermediation offices for Indonesian universities. Draft guidelines will be developed and workshopped by July 2018 and will be used to directly inform the current review of the regulations governing intermediation offices in Indonesia, for which Ristekdikti's Directorate of Industry Innovation is responsible. Once the guidelines have been accepted by Ristekdikti they will be workshopped with a wider group of stakeholders, including RIs in August / September 2018. . The study tour in February is also crucial for UNRAM and UNEJ and the establishment of their own intermediation offices, as discussed below.

8.3 Establishment of Intermediation Offices (RI capacity)

UNEJ–Centre for Intermediation and Innovation: In July, ARISA (facilitated by Dave Fleming) ran workshops on different models to engage with the private sector, and held discussions to agree on the role of UNEJ's planned centre. Through this workshop, UNEJ were able to identify strategic sectors of engagement and identify how the centre should function.

A follow up workshop was held with UNEJ in August, with a focus on supporting UNEJ to draft a realistic business plan. This was used to guide a discussion with the Rector about the scope, objectives, role and resources required for the intermediation office, which has since been approved, and the centre launched on November 10, with Pak Santosa and Andrew Ash in attendance.

While there is still a significant amount of work to be done before the Centre is fully functional, two significant outcomes have emerged from support provided through ARISA: first, UNEJ expanded its original plans that focused on spin-off companies, to include different models for engagement within the intermediation office, such as partnering with Agro-Science and Technology Park to facilitate connection between science and business incubators. Second, after initial discussions at the July workshop, UNEJ is exploring an expanded partnership with ASTRA (a large palm oil company) which takes advantage of a wider range of research expertise from the university. Additional partnerships are also being pursued with eco-tourism and coffee companies.

In addition to supporting the establishment of the intermediation office at UNEJ, ARISA is supporting UNEJ to establish a system for Planning, Monitoring, Evaluation and Learning (PMEL). Building the capacity of UNEJ to effectively manage the intermediation unit based on its performance against the agreed plan. The August discussion (above) was the first step to developing this system, setting an agreed plan for the Centre, which then guides what is monitored, and how it is evaluated. The February study tour will be instrumental in helping UNEJ to learn from the experiences of established intermediation offices in PMEL, and will directly inform the design and establishment of monitoring and evaluation systems. Hadi Zulfiquar, who formerly worked for the Intermediation Office at the University of Newcastle, will provide ongoing mentoring and support to UNEJ to ensure sustainability of the Intermediation Office beyond the life of ARISA.

UNRAM–Business Innovation Centre: A workshop was held with UNRAM in July to provide advice on different models for an intermediation office, strategic areas for engagement, human resourcing and financial management. A short report based on the discussions at the meeting was submitted to the Senate of UNRAM for discussion and

approval. This has been delayed due to the recent process for electing a new Rector. However, there is an ongoing strong desire from senior staff in UNRAM for the Business Innovation centre to be established in 2018.

8.4 Comparative advantage studies

These two studies aimed to compare the needs and priorities of local industry against the core strengths and research areas of UNEJ and UNRAM. They also highlighted new opportunities for collaboration, or opportunities for the universities to reposition themselves to better respond to industry needs.

The UNEJ comparative advantage study was conducted in August. In contrast to the UNRAM study, (carried out in the previous reporting period) key staff from UNEJ travelled with the ARISA team to conduct interviews with the private sector. This provided an opportunity for UNEJ staff to better understand the needs and priorities of industry in East Java first-hand and therefore contributed to capacity building efforts.

In general, the private sector in both instances is under-developed and dominated by small-scale enterprises who have limited ability or incentive to partner with research institutes. Larger companies do not have a strong presence within the regions and a number that are present are state owned. There is a role for intermediation offices in both UNEJ and UNRAM to promote the potential of research and technology to state-owned companies and capture feedback on relevance, feasibility, further development required.

The universities are also well-positioned to support local government priorities, and to play a role in facilitating innovation that supports regional specialisation. Both universities have strong reputations in equitable engagement with communities, and these networks and local knowledge can be valuable entry points for companies adapting their products to local contexts.

There are still significant challenges in terms of having a conducive policy environment that enables universities to make the most of their intermediation offices that are focused on impact or use of research (eg. in terms of proper resourcing and capabilities; incentives that favour academic success measures).

Key recommendations of the studies include greater strategic planning of intermediation units which consider local/regional innovation needs and opportunities, and carefully consider which mode(s) of engagement are best suited to meet these needs. ARISA has been able to support this in UNEJ and UNRAM, however this is an important consideration for Ristekdikti's revisions of their regulations and support to universities. This represents a shift away from replicating a (single) successful model from one place to the next, and instead accounting for local context.

Further information on the comparative advantage studies are presented in **Appendix 5**.

The comparative advantage studies formed the basis of discussions with UNEJ and UNRAM regarding the establishment of their respective intermediation offices (see previous section).

8.5 Case studies of ARISA RI-PS partnerships

The aim of the case studies is to summarise the detailed chronology of information contained in the innovation practice logs (organisational histories, evolution of the partnerships, key events and challenges etc.) into broader narratives that distil key lessons and insights from the partnerships. These case studies will form the basis of an overarching comparative analysis that will provide generalised lessons on the opportunities, challenges and dynamics of research-private sector partnerships.

The case studies are first drafted based on a review of the practice logs, with input from key ARISA staff, particularly those based in Indonesia, who in-depth knowledge of the dynamics of the partnerships. Once drafted, further discussions are conducted as required with partners to clarify any issues that are unclear and to 'ground-truth' these largely external assessments against the partners' experiences. Case studies will then be revised and finalised for broader distribution.

Though not all case studies have been drafted, some selected early themes include:

- *University networks and social capital:* A key feature of many of the researchers involved in ARISA, is their enduring relationships of trust with local communities, governments and other local stakeholders. These networks are, in part, borne out of the University mandate to contribute to rural and community development, and they provide a unique element to many of the partnerships in ARISA. With the exception of Dairy, in which Nestlé has its own long-standing networks with the cooperative, the RIs offer access and legitimacy to the private sector, at times at a value greater than their technical and research expertise. The implication of this finding is that, although the community-service principle has, in some cases, encouraged researchers to focus on community outcomes *at the exclusion* of private sector involvement, there is a value in balancing both networks. Any changes to university performance incentives should consider the additional values of strong community networks in incentivising the private sector to partner with universities.
- *Sharing risk:* Partnerships, theoretically, have the benefit of sharing risk across different actors. However, in the ARISA partnerships, there is evidence of risk being borne initially by university partners who put close community-networks and reputations on the line by introducing private companies (with various degrees of trust within the community) and introducing farmers to different degrees of financial risk. Having a facilitator/broker such as ARISA that can help provide some stability has been important to bridge these periods of uncertainty.
As partnerships progress, different kinds of risk emerge and are experienced by different actors. Given the goals of ARISA and AIP-Rural more broadly in supporting poor-farmers, partnerships that bring greater market participation and exposure necessarily bring with them greater risks for farmers, particularly in the context of unpredictable markets and variable weather. For example, given the variable climate in North and East Lombok (climatic risk) farmers taking out loans for maize inputs also expose themselves to financial risk. Further consideration as to how to manage some of these different risks (eg. micro-insurance) is worth considering.
- *Champions:* The insights from the partnerships reinforce the widely accepted, but important point in the literature that dynamic, innovative, motivated individuals (or champions) can have a significant influence over the success of a partnership. In ARISA, these champions have mostly had a focus on brokering, networking and facilitation to support the dynamic nature of the partnerships. This marks a significant departure from traditional research roles at the Universities and as such, are not necessarily recognised in the University incentive system. It may also not be the best use of their expertise, and may indicate missing actors in the innovation system. This is a key area for discussion with Ristekdikti, UNRAM and UNEJ in particular.

To date, first-drafts have been completed for the Maize and Dairy partnerships, revisions will be made to these based on RI-team discussions at the RI workshop (14-15 February). The Maize case has been included as **Appendix 6**, though it is important to note this is a draft for discussion with the UNRAM team and not for wide-spread distribution. A first draft, for discussion with in-country teams, will be completed for Sugar, Cassava, Beef and IPM by the end of April. An additional case study will also document the process, lessons and insights gained from the design and implementation of the grants process.

The case studies will be published, alongside the over-arching analysis, as a key output to disseminate ARISA lessons and contribute to a broader understanding of research-private sector partnerships. Prior to the finalisation of these outputs, early insights from the case studies form the basis of ongoing discussions with partners, Ristekdikti and the ARISA team. Final results will be discussed at a roundtable of key stakeholders (Ristekdikti, private sector, local government) to explore implications for policy schemes and institutional incentives.

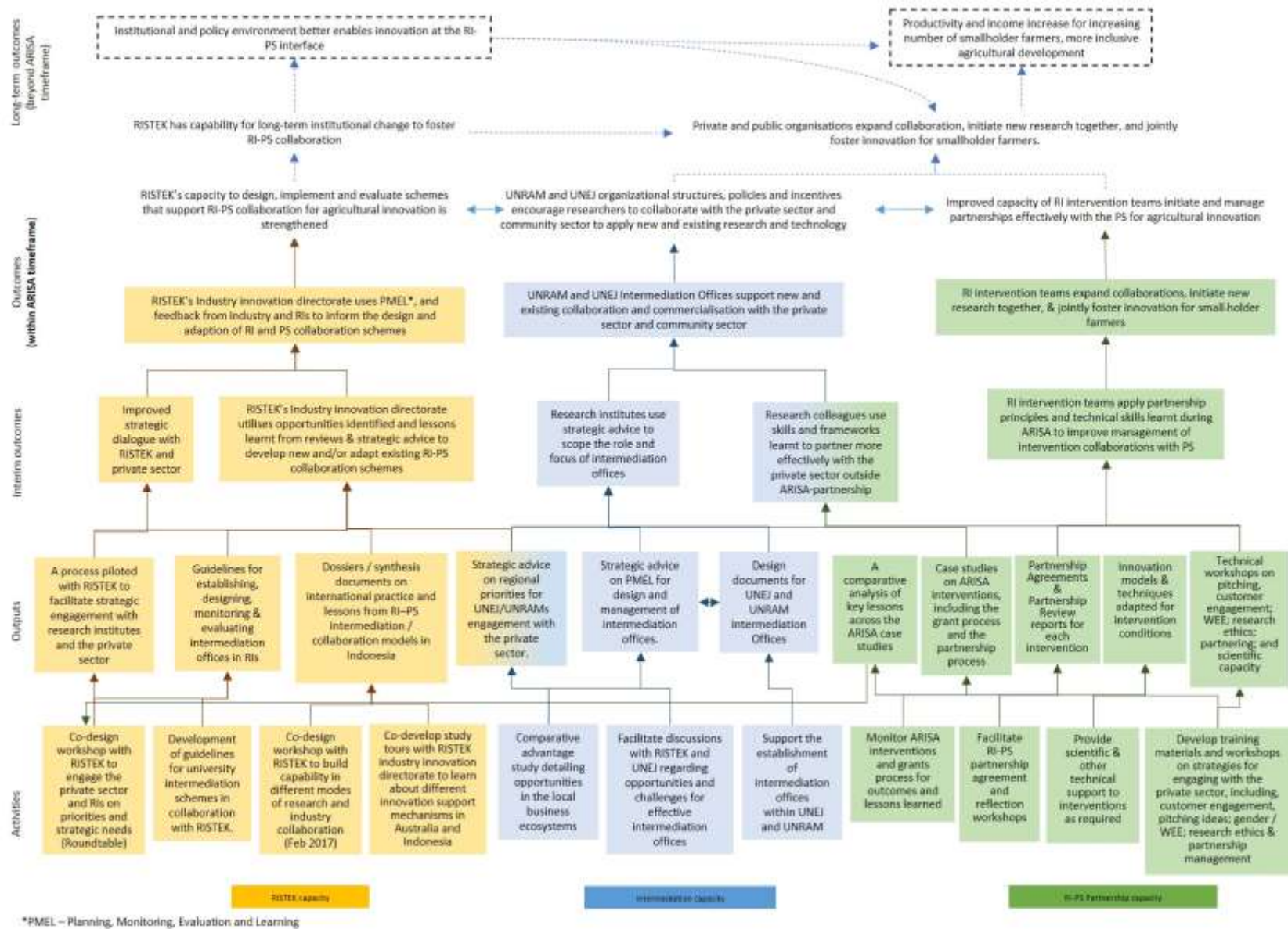


Figure 2: Revised Theory of Change

9. ECONOMICS RESEARCH

Kanar Dizyee joined the ARISA team in April 2017. He has continued to progress the economic modelling that Ben Henderson and Neil MacLeod started, including the following:

Beef

Following multiple rounds of revisions, based on the feedback received by three anonymous reviewers of PLOS ONE journal, the beef value chain model and paper were finalised and published in August 17th 2017. The paper can be accessed at the following link

<http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0183365&type=printable>

Cassava

During this period the dynamic model of the MOCAF value chain has been updated based on the recent drop in cassava price which has resulted in an adjustment in the expected adopters to produce cassava. The introduction of tape (boiled fermented cassava) has also resulted in changes to the model built in the first half of 2017 to include the new trading channels of tape and trading cassava to duck farmers. This model is scheduled to be completed in April 2018, following a trip to UNEJ in Feb 2018, during which the outline of research paper with project partners will also be updated.

Dairy

Preliminary economic research by CSIRO on the dairy project began in the second half of 2017. An initial outline of the dairy value chain was sketched out and a work plan was shared with the in country project team. Kanar Dizyee will visit dairy project team in Malang in Feb 2018 to discuss the construction of a system dynamic (SD) framework to capture the complexity of the dairy value chain in Malang that takes into account multiple chain actors including milk producers, traders, and fodder suppliers. The SD model will facilitate understanding and assessing the challenges and opportunities in the dairy project value chain.

11. CONTRACTED MILESTONE DELIVERABLES

A summary of progress against each of the contracted milestones is given below. It should be noted that the contracted milestones are based on the original design document, prepared in early to mid-2014 and don't now match closely the reality of project implementation in terms of timing, although the overall goals and targets are still relevant.

A) At least 10,000 participating smallholders adopt project sponsored innovations

Adoption and access is ramping up with over 12,428 (cumulative) households having accessed information on interventions and around 5,772 (cumulative) now adopting new practices in the interventions. Outreach numbers are increasing and are at 4,448 households. New estimates of outreach at the end of the project are still in excess of 10,000 farmers.

Participating RIs have at least 2 more potential collaborations (fitting the selection criteria) in their immediate pipeline

As a result of the RI capacity building undertaken in Brisbane in May 2017 on customer engagement and working with a wider variety of collaborators, the RI teams are now actively looking for opportunities to work with companies and government. They increasingly have the ability to pitch their ideas and negotiate how to collaborate.

The maize intervention has a number of collaborations which have emerged in the last 6 months. The local governments in North and East Lombok are very interested in using the Syngenta maize seed and UNRAM innovations tested and commercialised as part of the intervention in their subsidised maize program. This in turn offers opportunities for Syngenta to supply the seed and UNRAM to disseminate the innovations to extension officers and farmers in areas outside the original scope of the intervention. The UNRAM team has also interacted with a range of other potential partners from the private sector (e.g. CV Sukses Agro Mandiri) relating to the buying and trading of maize, and providing training to farmers in post-harvest technology.

In cassava the intervention team has successfully scoped out a new business opportunity for Tape cassava around Bondowoso. New collaborations are emerging with SMEs as a result of this intervention. The collaboration collecting data on the efficacy of the fertiliser trails of the products sold by the companies previously involved in the PRISMA interventions on cassava (e.g. PT Nasa) is continuing.

The true seed shallot intervention started this semester. It is a partnership between PT EWINDO and Bandung Institute of Technology (ITB), and linked to the PRISMA intervention for the production of true seed shallots (TSS). This intervention aims to improve pollination for TSS production, by testing and developing a range of insects, including several species of bees and flies. This work will continue in 2018.

The number of requests made by private firms to participating RI has increased by a further 25% in the last 12 months

Increasingly firms are approaching the RIs to work with them. This is largely as a result of the companies seeing the benefit of the research and interactions with communities. In all of the interventions, while the technical research is important, another primary reason for the private sector to approach the RIs is their ability to work with communities and the trusted relationships they bring

which are invaluable. It is increasingly clear that a key role for RIs is in brokering the relationship between companies and farmers.

UNEJ has been the most successful in obtaining requests from private firms to collaborate. They have established their intermediation unit and are actively pursuing relationships with the private sector. They have been approached by companies, including PT ASTRA to undertake research on their palm plantations and by Ecotourism and coffee companies.

In sugarcane the collaboration between ISRI and PT GMM has formed. PT GMM approached ISRI to collaborate. They have conducted a series of training events for new sugarcane farmers in Pamekasan and Sumenep District and PT GMM has established trial sites at their company farm. In maize, Syngenta has requested that UNRAM work with them as they expand the sales in Sumbawa.

Bank NTB has also requested that UNRAM assist them as they establish the loan system with farmers. A private company has approached UNRAM to become involved in the purchase and processing of maize following harvest. In the beef intervention, a new partner in Bank BRI is emerging. Bank BRI are providing loans to farmers to establish leucaena plantations and purchase cattle as they are now engaging more closely with the project team.

EWINDO approached the Institute of Technology, Bandung to seek their involvement in solving problems in pollination with true seed shallots. EWINDO and ITB subsequently approached ARISA about establishing a small intervention to test the efficacy of new insects as pollinators of shallots. This has led to the establishment approached ARISA to

B) At least 6 participating private firms have financed 30% of their intervention costs

The companies have continued to invest in the interventions covering their operating costs. Increasingly the companies have started to cover other costs related to the intervention. In the last 6 months they have increased their investment invested to IDR5 billion, totalling IDR 11billion since the start of the project (see Table 5).

In IPM, PT NuFarm has co-invested in large number of demonstration sites in Probolinggo, Pare and Nganjuk for the promotion of IPM for dry season shallot production (value of investment IDR 178,000,000). They continue to invest in and expand their on the ground teams for the sale of the Bt product and to provide technical advice to farmers in these areas.

In dairy, PT Nestle has provided the first loan for fodder business development to the dairy cooperative in Semen. This Rp 200 million loan, with a grace period of six months, will help the cooperative to start up a new fodder business. They have invested IDR 256,046,000 since the start of the intervention.

In sugar cane PT GMM has established demonstration sites in company locations. They have also started to provide support for the newly trained sugarcane farmers, including assistance with land preparation, fertiliser inputs, promotion of good agricultural practices, and harvesting. They have invested IDR 1,218,759 since July 2017. The total investment by PTPNx and PT GMM has been IDR 608,818,759.

In maize, Syngenta invested IDR 4,787,400,000 in the 6 months from July to December 2018, totally IDR 8,609,400,000 since the start of intervention.

In cassava investment has been by small firms in the last 6 months totally IDR 74,000,000. In total the private sector has invested IDR1,888,000,000 in the cassava intervention.

Table 5: Private Sector investment Y17S2 and cumulative

Intervention	Investment Y17S2	Cumulative investment
Beef	-	25,900,000
Maize	4,787,400,000	8,609,400,000
Cassava	74,000,000	1,888,000,000
Sheep	-	340,600,000
Sugarcane	1,218,759	608,818,759
Dairy	10,000,000	380,586,000
IPM	178,000,000	178,000,000
Cumulative	5,050,618,759	12,031,304,759

C) At least 4 public events aimed at decision makers have been conducted to present the results of collaboration case studies

The ARISA team have presented at a number of events at which policy makers, government, private sector and research institutions were present, many of whom are decision-makers within their institutions. These include:

- Andrew Ash gave a plenary presentation at the 5th International Seminar Of Animal Nutrition & Feed Science, held in Lombok in November, 2017 on the beef intervention
- Andrew Ash gave a keynote presentation at the World Plantation Conference, held in Jakarta in October on ARISA
- Michaela presented on Building Partnerships for Food Security and Sustainable Agriculture in the face of Climate Change at the FoSSA Conference, 2nd August 2017. The presentation focused the ARISA partnerships between the research institutions and private sector as a key mechanism of catalysing innovation to increase agricultural resilience.
- Andrew Hall presented on Agricultural Innovation Systems in Indonesia at The Indonesia Development Forum (IDF), 9th to 10th August 2017. IDF is an international conference hosted by BAPPENAS in collaboration with the Australian Department of Foreign Affairs and Trade (DFAT) through the Knowledge Sector Initiative (KSI). The Forum is a platform for development practitioners in the public, private, and non-profit sectors to meet and exchange ideas on how to promote new thinking on national development. IDF also features best practices, challenges and lessons learned by development actors. Over 500 people attended.

D) A Semester Progress Report, complying with guidelines of AIP-Rural's Secretariat is completed

Semester reports (PRIP) are provided, which include 6 month and 12 month Workplans.

12. MANAGING RISKS

The risk matrix is in a separate Excel spreadsheet. Risks within the project's control can be managed so that the residual risk is low to moderate. These include governance, project implementation, fiduciary, reputational risk and workplace, health and safety. Project delivery risks remain high, especially where aspects are outside the project's control e.g. collapse in commodity pricing rendering that sector or commodity unviable. Overall portfolio risk is moderated by ensuring a diversity of sectors, partners and delivery pathways.

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13. WORKPLAN FOR NEXT 12 MONTHS

Table 6: Workplan for the period January to December 2018.

	January to June 2018	July to December 2018
Overall Program Management	<ul style="list-style-type: none"> Sixth Milestone Report (as part of Semester Report) delivered to DFAT Agree on transition plan to Phase 2 with DFAT and Palladium 	<ul style="list-style-type: none"> Seventh Milestone Report (as part of Semester Report) delivered to DFAT Implement transition plan from Phase 1 to Phase 2 (focus on staff and interventions)
Intervention Management	<ul style="list-style-type: none"> Continued implementation and adaptation of eight existing interventions, including: (1) Options for scaling out the pig feed intervention with PRISMA, (2) Options for expanding the IPM intervention to include cabbages with PRISMA, and (3) Options for improved pollination for shallot seed production with PRISMA. Collaboration with SAFIRA for maize in Lombok and Sumbawa, and possibly for sugarcane in Madura Continued technical assistance from CSIRO specialists (e.g. improved pollination for true seed shallots). Adaptive planning to get maximum outreach from the final year of the ARISA interventions. 	<ul style="list-style-type: none"> Closing down of interventions that are due to be completed in this semester (most or all of them). End of intervention reports, contracting, financial acquittals, final payments and drafting of lessons learned. Looking at possibilities to continue some of the successful interventions as part of AIP/PRISMA phase 2. Drafting of overall lessons learned and recommendations from all eight interventions. Assessment of where we are with the DCED numbers for access, use and benefit, and DFAT indicators for the interventions.
PCC	<ul style="list-style-type: none"> PCC meeting Ristekdikti 	<ul style="list-style-type: none"> PCC meeting with Ristekdikti
Results Measurement & Learning	<ul style="list-style-type: none"> Continued implementation of recommendations from pre-audit 6 On-going Baselines and 3 Impact Assessments 	<ul style="list-style-type: none"> 6 Final Impact Assessments
Gender	<ul style="list-style-type: none"> Implementation of the revised gender focus with maize, IPM and cassava. Assessments of changes for women and gender impact stories for each intervention Gender workshop with research institutions 	<ul style="list-style-type: none"> Implementation of the revised gender focus with maize, IPM and cassava. Gender impact stories for each intervention
Innovation System Research and capacity building	<p>Innovation System Research</p> <ul style="list-style-type: none"> Study Tour to 4 Intermediation Units with RISTEK, UNEJ and UNRAM Guidance Note on Establishment of Intermediation Units. Analysis of at least 6 case studies on ARISAs interventions Analysis of comparative advantage study Jember & Lombok finalised Workshop for all RIs on sharing experiences and skill development (Feb) 	<p>Innovation System Research</p> <ul style="list-style-type: none"> Reflection on MEL pilot for UNEJ intermediation office with Ristekdikti and UNEJ Roundtable with key stakeholders from Ristekdikti, UNRAM, UNEJ, the private sector, local government, etc to discuss innovation system research findings and implications for policy schemes and institutional incentives

	January to June 2018	July to December 2018
	<ul style="list-style-type: none"> • Ongoing mentoring support to UNEJ and UNRAM in developing capacity to establish their intermediation units • Ongoing capacity building developing skills re-enforcing business-like behaviour in RIs • Ongoing MEL capacity building with Ristekdikti and UNEJ • Draft guidelines on establishment and functioning IUs developed for Ristekdikti 	<ul style="list-style-type: none"> • Ongoing mentoring support to UNEJ and UNRAM in developing capacity to establish their intermediation units • Ongoing capacity building developing skills re-enforcing business-like behaviour in RIs • RI lessons learnt workshop (Nov) • Drafting of lessons learned from ARISA's approach and mode of operation (what worked, what didn't work, what we would do differently next time). • Ongoing MEL capacity building with Ristekdikti and UNEJ • Guidelines on establishment and functioning IUs finalized with Ristekdikti and the socialized to IUs and RIs through a workshop.
Economic modelling research	<ul style="list-style-type: none"> • Developing and refining the economic modelling for Beef, Cassava and Dairy 	<ul style="list-style-type: none"> • Refining the economic modelling for Beef, Cassava and Dairy and lessons learnt capturing
Communication	<p>Proposed</p> <ul style="list-style-type: none"> • Two farmers of Indonesia stories based on the interventions • One impact story on IPM • One story on establishment of intermediation units <p>Completed</p> <ul style="list-style-type: none"> • Two Farmers of Indonesia stories (IPM shallots; dairy) • Three Commodity Snapshots stories (IPM shallots; dairy; cassava) • One Approach in Action story (comparative analysis study) 	<p>Proposed</p> <ul style="list-style-type: none"> • Two farmers of Indonesia stories based on the interventions • Other products to be determined <p>Amended</p> <ul style="list-style-type: none"> • Two Farmers of Indonesia stories • Two WEE stories • Two Partner Perspectives stories • Three Approach in Action stories (at least two research-based) • Four Commodity Snapshot stories

APPENDICES

Appendix 1: PCC Meeting Minutes

Australia Indonesia Partnership for Rural Economic Development (AIP-Rural) Applied Research and Innovation Systems in Agriculture Project (ARISA)

Project Coordination Committee Meeting, No. 3

Date: 1.30pm to 4.00pm, Thursday November 9, 2017.

Venue: AIP-Rural Offices, Surabaya

Participants

1. Pak Jumain Appe, Ristekdikti
2. Pak Santosa Warsono, Ristekdikti
3. Dr Ophirtus Sumule, Ristekdikti
4. Dr Muhamad Amin, Ristekdikti
5. Ibu Rani Noerhadhie, DFAT
6. Andrew Ash, CSIRO-ARISA, (Chair)
7. Ibu Listyani Wijayanti, (ARISA Liaison Officer)
8. Archie Slamet, CSIRO-ARISA
9. Robert Caudwell, CSIRO- ARISA

Minutes of Meeting

1. General ARISA progress

Andrew Ash provided an overview of progress based on the previous Semester Report. This included progress on operations and the changes in staff in recent months with Lauren Xie departing, Yustika Munharastri taking over the management role for monitoring and evaluation and Ajeng Astrina being employed to provide assistance to the DCED monitoring and evaluation activity.

Rob Caudwell provided an overview of the progress in the different interventions and there was some discussion about the details and partnerships involved in the different interventions, although no specific actions emerged.

Andrew Ash gave an overview of outreach and the DCED measurement and monitoring activities, which generated a number of questions and discussion.

2. Work with Ristekdikti on Intermediation Offices and innovation systems

Since the previous PCC meeting there has been an increased level of engagement with Ristekdikti on Intermediation Offices, private sector engagement and monitoring and evaluation. A document summarising the progress and the proposed workplan from November until the end of 2018 was tabled at the meeting (Appendix A).

Pak Jumain and Pak Santosa indicated that Ristekdikti is wanting to progress the collaboration with ARISA to the point where new processes and guidelines can be implemented by Ristekdikti. Pak Jumain indicated that in innovation, not only the upstream but the downstream processing must be considered.

As for intermediation units, Pak Jumain suggested that it will be best if the units can be established in every University, with their programs aligned to the innovation incentives in Ristekdikti and that there is a process in place for evaluating their progress together.

Andrew Ash outlined the plan for a cross learning, capacity building activity that will involve research institutes who partner with ARISA and Ristekdikti who will engage with universities where intermediation offices are more advanced. Ristekdikti is going to select the 5 (five) Universities where intermediation is more advanced. Key areas for learning include: Legal aspect of the Institution, Timeline of Operation, Operational Management, Potential Innovation, Field of focus, Strategic Partnerships. The cross learning is formerly scheduled in 22-31 January 2108 but seems likely to be delayed slightly to accommodate availability of all RIs and Ristekdikti staff.

Action: Andrew Ash to follow-up with Michaela Cosijn and Bu Lies to confirm dates for cross-learning.

3. Presentation from Pak Jumain on Ristekdikti and their engagement with ARISA

Pak Jumain gave a powerpoint presentation (separate electronic attachment) on Ristekdikti in the context of Indonesian innovation systems and the partnership with ARISA. He concluded by outlining some expectations from Ristekdikti:

- The adoption of ARISA's PMEL (Planning, Monitoring, Evaluation, Learning) toward innovation programs in Directorate General of Innovation Strengthening (e.g. Beef cluster – University of Mataram NTB, Industrial salt cluster – University of Trunojoyo Madura, Tropical Fruits and Rice – Bogor Agricultural University and Patchouli Oil -University of Brawijaya Malang).
- ARISA providing guidance towards Indonesian innovation policy, especially innovation clusters (Salt cluster in Jeneponto South Sulawesi, Rice cluster in Banggai Central Sulawesi, Coffee cluster in Toraja South Sulawesi, Palm sugar cluster in Sinjai South Sulawesi, Patchouli Oil cluster in Aceh).
- Co-evaluating the ARISA programs to gain insights and lessons that can be applied by Ristekdikti.

4. December visit to Australia

Andrew Ash provided an overview of the upcoming visit to Australia by key Ristekdikti staff, scheduled for 4-9 December 2017.

Participants from Indonesia are : Dr. Jumain Appe, Mr Santosa Yudo Warsono, Dr. Adawiah M. Hasan, Dr. Muhamad Amin and Dr. Listyani Wijayanti.

Institutions being visited include: University of Queensland, CSIRO, Australian National University, IC, Rural Research and Development Corporations, RDC, Commonwealth Department of Agriculture, Commonwealth Department of Industry, Innovation and Science, and DFAT.

Discussions with CSIRO will focus on the private sector capacity building program (ON), developed by CSIRO, as well as discussions with Andy Hall and Jen Kelly on the proposed program of work for the next 12 months.

5. BAST progress

Dr Amin gave an overview of the BAST process which included the following steps:

- Registration Memo of Goods/Services/Securities Direct Grant (*Memo Pencatatan Hibah Langsung Bentuk Barang/Jasa/Surat Berharga (MPHLBJS)*)
- Official Report of Document Handover (*Berita Acara Serah Terima/BAST*)
- Statement of Direct Grant Reception (*Surat Pernyataan Telah Menerima Hibah Langsung (SPTMHL)*)
- Statement of Responsibility (*Surat Pernyataan Tanggung Jawab Mutlak/SPTJM*)
- Endorsement Letter for Goods/Services/Securities Direct Grant Revenue (*Surat Pernyataan Pengesahan Pendapatan Hibah Langsung Bentuk Barang/Jasa/Surat Berharga (SP3HLBJS)*)

Registration of documents (MOU and IA) has occurred and information on expenditure with Indonesian research institutes is being collected and documented.

Action: Ibu Lies and Pak Amin to progress the BAST process to meet the deadline dates required by the Ministry of Finance.

5. Next meeting

The next meeting will be held in May 2018, which will give Ristekdikti a chance to visit an intervention and to more closely engage with UNRAM on its intermediation office.

Meeting closed at 4.00pm.

Appendix A. Draft PCC Six (6) monthly progress report: Innovation Systems Research Activities

Retrospective report

Over the last 6-12 months the scope of the innovation systems research has been broadened to better consider the motivations and incentives of the private sector to partner with Research Institutes (RIs). Good progress has been made in these revised key areas of activity. These activities have included:

- (a) **Comparative Advantage:** field work in Lombok and Jember was undertaken in April and August to advance a Comparative Advantage study. This study explores opportunities emerging for RIs in the local 'business ecosystems' and seeks to identify thematic clusters that might act as a focus for RI engagement with the private sector. It compares the strengths of the universities alongside the business and market dynamics to understand the potential for driving private sector engagement. This study is based on a review of market opportunities and interviews with a range of stakeholders (government, businesses, associations) in these two areas.

Preliminary results from the Comparative Advantage study in Lombok and Jember suggest that there are considerable agricultural innovation opportunities in existing and emerging dynamic market sectors (for example tourism in Lombok and Seeds in Jember). However, the analysis also confirmed that there are few incentives for the private sector to partner with RIs. This partially reflects the small size of many companies—many of which are traders rather than value adding businesses. Large (often multinational) companies have clearer incentives to work with RIs. However their incentive is not necessarily related to the research and technologies of the RIs. Instead it is the strong local links to communities that the RIs often have which is the basis of the partnerships, as this creates a legitimacy and trust which helps to facilitate the adoption of products sold by the company. Similarly RIs can provide companies with access to local government, in the hope that they will support schemes that promote their products.

- (b) **Comparative Analysis of the ARISA Interventions:** Another element of the innovation systems research is a Comparative Analysis of the ARISA interventions. Using the ARISA interventions as case studies, this synthesises lessons about the effectiveness of different engagement models within the broader context of local innovation processes. The focus of this analysis is on what worked well and what didn't. It will include a discussion of the implication for future program design to foster innovation at the RI-private sector interface. This study is based on information collected through innovation practice logs, 6 monthly intervention reports and stakeholder interviews.

Data and insights will continue to be collected through the intervention innovation practice logs. As already mentioned these are feeding into the development of a series of case studies, that aim to place the local innovation processes within the broader context of policy and market dynamics, and directly comparing the different starting points and mechanisms used in the interventions (e.g. research-led, private sector-led, commissioned). Two draft case studies have been developed and another two are expected to be developed early next year. Preliminary comparisons across these cases will be presented at the RI Capacity Building workshop in February 2018.

Given the under-developed, fragmented, trade focus, low technological sophistication and small scale nature of much of private sector agri-business, simple bilateral partnerships between the public and private sectors are unlikely to be only route to unlocking new innovation opportunities. Instead, a much broader set of collaboration is required across government, multiple businesses and research institutes, and most probably in a pre-competitive fashion. More generally, both the Comparative Advantage study and the Comparative Analysis of ARISA interventions suggest that alignment of national and regional policy to support innovation opportunities is currently missing or weak and needs to be tackled in the design of future innovation support interventions.

- (c) **Establishment of two Intermediation Units:** Building on the preliminary findings of the Comparative Advantage study and capacity building activities around different principles and practices of intermediation, the ARISA innovation systems research team has engaged with UNEJ and UNRAM to

establish their intermediation unit. UNRAM is still seeing approval for this from their Rector. However, UNEJ obtained approval from their Rector in June. Therefore ARISA has supported the UNEJ team to develop a draft business plan for their Centre for Intermediation and Innovation (CII). This draft business plan was to be used in discussions with the Rector around the scope, objectives, role and resources required for the centre. Once this plan is agreed, discussion and mentoring can continue around appropriate MEL approaches and strategies to monitor and evaluate the relevant, effectiveness, and efficiency of the centre.

For more information about all the activities undertaken in the last 6 months refer to the following table, which provides an overview of key activities implemented over the last 6 months.

Date	Activity	Partners / Actors involved	Output
May	RELATED CAPACITY BUILDING ACTIVITY: Capacity Building on customer engagement and establishment of research commercialisation units (UniQuest) in Brisbane Australia (1 week)	ARISA All Ris CIPGCIPG Ristekdikti	Workshop Reports for UNEJ and UNRAM
May	ARISA Liaison Office appointed for Ristekdikti	ARISA Ristekdikti	
May	Data collection in Lombok for Comparative Advantage Study (2 weeks)	ARISA UNRAM Local businesses Local government	A Comparative Advantage Study (Under-development) <i>Note: this is the same report as mentioned below</i>
June	Meeting with UNEJ to discuss progress of Intermediation Unit	ARISA UNEJ	
July	RELATED CAPACITY BUILDING ACTIVITY: Masterclass in essentials for intermediation offices	ARISA UNRAM UNEJ	Workshop Reports for UNEJ and UNRAM
August	Indonesia Development Forum: Lessons learnt from ARISA presentation	ARISA KIS	Conference Presentation
August	Data collection in Jember for Comparative Advantage Study (2 weeks)	ARISA UNEJ Local businesses Local government	A Comparative Advantage Study (Under-development) <i>Note: this is the same report as above below</i>
August	Strategy workshop with UNEJ CII team	ARISA UNEJ	A draft business plan for the CII
October	Meeting with Ristekdiktis Director Industry on preliminary lessons from UNEJ to support establishment of its CII	ARISA Ristekdikti	
October	Meeting with CIPG to continue dialogue on intermediation strategies and potential cross learning opportunities with the S&T park project	ARISA CIPG	

Forward report

For the next 6-12 months of the project, the innovation systems research team will be focused on consolidating lessons from the intervention partnership, facilitation of intermediation office development which will include dialogue with the project partner's, specifically the RIs and RISTEK, as well as other key stakeholders. Through ongoing dialogue, capacity building activities and practical and contextual advice (specifically advice on MEL and intermediation offices), the innovation systems research team aims to support:

- i) Ristekdikti in their efforts to strengthen and grow Indonesia's innovation system through new and existing innovation support schemes, incentives, guidelines and/or initiatives that support university - industry
- ii) UNEJ and UNRAM establishing new intermediation offices through lessons that can guide decisions about the Research Institutes rational for establishing and office and contextually appropriate intermediation strategies.

This will be done primarily in collaboration with the ARISA capacity building team and engagement with external stakeholders such as CIPG and KIS where appropriate.

The following table provides an overview of proposed key activities.

Due Date	Activity	Partners	Proposed Output
November	Respond to feedback from SRP	ARISA	Revised/updated Theory of Change
January	Learning mission established Intermediation Offices/Units to review: <ul style="list-style-type: none"> - What the business model is? - What is and isn't working? - Challenges and strategies employed to overcome them - Advice for people starting now ... what would you do differently (est 10 days)	ARISA Ristekdikti UNEJ UNRAM CIPG	
February	RI Capacity Building focused on lessons from activities relating to Intermediation Offices delivered to date (est 2 days)	ARISA Ristekdikti All RI partners CIPG	Conference / workshop presentations on i) Key findings from the Intermediation learning mission, ii) Preliminary Findings from the Comparative Advantage Study , and iii) intermediation strategies for RIs in the Indonesian context
February	Continued dialogue with RISTEK S&T project on intermediation strategies	ARISA CIPG	Meeting / Workshop to discuss learning and collaboration opportunities going forward
February	Follow up meetings about progress of the CII and possible MEL strategies and approaches	ARISA UNEJ	Draft MEL plan for CII
April	Case studies on lessons learnt from ARISA intervention	ARISA	4 x Case Studies
April	Dialogue with RISTEK on lessons from interventions and implications for policies, incentives, regulations, and interventions (est 2 days)	ARISA Ristekdikti Private sector	Meeting / Workshop about implications of lessons from case studies and strategies for industry engagement that can responds to Indonesia's context
May	Report: Comparative Advantage study	ARISA	Report / Paper

Due Date	Activity	Partners	Proposed Output
June	Strategy workshop with UNRAM Business Innovation Centre (BIC) team (est 2-3 days)	ARISA UNRAM	A draft business plan for the BIC
September	Report/Paper: Comparative Analysis of Case Studies on lessons from interventions	ARISA	Report / Paper
November	Dialogue with RISTEK on lessons from interventions and implications for policies, incentives, regulations, and interventions	ARISA Ristekdikti RIs Private sector	Meeting / Workshop about implications of lessons from all ARISAs activities

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Appendix 2: DCED Pre-audit Report

Background and Methodology

The pre-audit review was conducted from the 28th-29th of August 2017 to assess the extent to which ARISA's MRM system complies with the DCED Standard Version VIII. Apart from the costing system, all control points and compliance criteria were checked for "system in use". The assessment relied on a document review and interviews with ARISA's staff and managers, as well as with staff members from partner research institutes. ARISA selected 3 interventions out of 6 on-going interventions to be covered in the per-audit review which were:

- Best practice for dual cropping models using new superior maize hybrid varieties with pulses (mung bean and ground nut) on drylands in NTB.
- Developing profitable and sustainable beef production systems in Sumbawa through engagement of cattle farmers with private beef enterprise.
- Integrated pest management for smallholder shallot farmers in East Java.

The consultants reviewed the relevant documents for the selected interventions and the documents for the program level. The consultants interviewed the intervention manager, MEL manager, MEL office, staff from partner research institutes, financial manager and the team leader. Findings and recommendations were then discussed with to the in-country team on September 4th, 2017.

Recommendations

A summary of key recommended actions to improve ARISA's MRM system to improve programme implementation and meeting expected level of compliance is provided below.

- **Business Model:** For some interventions, e.g. maize and beef, research institutes also perform some functions in the business models e.g. providing technical assistance which is currently funded by the programme. It is recommended that ARISA develop the clear exit strategy defining who will provide the services currently provided by research institutes and who will pay for it once the programme ends.
- **Key External Assumptions:** Some of the key risks/assumptions are documented in the proposal. However, they are not reviewed or revised when the business model changes. It is recommended to document key external assumptions in the ISD (e.g. under the results chain) so they are in one document and can be easily reviewed during the review meetings.
- **Results Chain:** Review the results chain to ensure that they are sufficiently detailed especially in the intermediary outcomes for both ISPs and farmers e.g. output of the activities lead to changes in capacities of the ISPs which lead to change in service provisions then farmers receive the services which lead to changes in their capacities then farmers changes their practices which lead to higher performance e.g. increase yields or improve product quality.
- **Indicators:** Since some of the results chain boxes contain more than one change, it is recommended the programme review the indicators in the MRM plan to ensure that indicators are defined for all changes in the results chain boxes and also ensure that the indicators define are "SMART" with clear unit e.g. kg/ha/annum.
- **Qualitative Indicators/Information:** Although the programme collects qualitative information from market observations, in-depth interviews, FGDs or impact assessment, the qualitative information to assess key behavioural changes of each actor in the business models is often missing. To improve the process, the first step is to use the results chain to define key behavioural changes of each actors. And, for each key behavioural change, define the qualitative indicators/information needs in the MRM plan to capture:
 - How are the changes taking place?

- Why are changes taking place? Or why not?
- Are changes likely happening because of the changes in the previous steps?
- To what extent are changes likely to be sustainable? For sustainability, also ensure that for each actor in the business model, there are at least one quantitative and one qualitative indicators/information to assess the likelihoods of sustainability.
- **Projections:** Currently, ARISA's projections start with the access numbers which are based on the estimate from research institutes. However, it is difficult assessing whether the projected access numbers are realistic given the time and resources to implement the interventions. It is recommended that ARISA takes additional steps to start projecting from the key driver of access number.
- **Monitoring Data Collection:** Currently, the timing for collection monitoring information in the ISD are too generic and not timely. To improve the process, the programme can take the following steps:
 - Utilise the results chain to identify the timing for collect the monitoring information and revise the monitoring plan in the ISD according and also ensure that information will be collected on a timely manner.
- **Attribution and Impact Assessment:** It is also recommended that the programme further improve the technical aspects of the plan to assess attributable changes:
 - **Attribution Strategy:** Ensure that considers counterfactual, external factors, and attribution method and rationale behind the selection of attribution methods are carefully considered.
 - **Baseline:** Ensure that the baseline information is collected on a timely manner to minimise the recall biases. Check with a few farmers for their recall abilities at the beginning of the intervention before deciding to use recall for reconstruct the baseline.
- **Strengthening Review Meeting Process.** It is recommended that the programme further improve the structure and documentation of review meeting process. The agenda of the review meeting should also cover the following issues:
 - How have the changes happened?
 - What is working or not working and why?
 - Review the assumptions that are underlying the logic of the result chains
 - What are the key lessons learned?
 - What needs to be improved?
 - What changes need to be made to the intervention result chains?
- **Roles and Responsibilities:** The AIP MRM manual also outlined roles and responsibilities related to results measurement including quality control system. However, due to different structure and staffing, the system outlined might not be fully compatible with ARISA. Hence, it is recommended to review the roles and responsibilities in the AIP MRM manual and adapt it for ARISA if necessary. In addition, since ARISA also works with partner research institutes to implement the interventions, it is recommended that ARISA also develop clear roles and responsibilities between ARISA and partner research institutes.

Implementation of recommendations

The above general recommendations were condensed into the 21 specific recommendations given in the table below. The ARISA team assigned one person to address each of these recommendations, and work commenced in September. Some of the recommendations have already been addressed, whilst some are on-going, and others will be dealt with in the first semester of 2018. The status of each recommendations is given in the table below.

Implementation of recommendations

No	Recommendation from pre-audit report	Person responsible	Status (end of December 2017)
1	Review the results chains to ensure that they are logical and sufficiently detailed.	Rob Caudwell	Completed
2	In terms of details, focus on the intermediary outcomes for both service providers and farmers. The results chain should have sufficient steps. So, the logic can be easily followed.	Rob Caudwell	Completed
3	Develop the clear exit strategy defining who will provide the services currently provided by research institutes and who will pay for it.	Rob Caudwell	Completed
4	Document the summary of key external assumptions in the ISDs.	Rob Caudwell	Completed
5	In the gender section of the ISD, summarise the key gender related issues from FGDs and how the intervention will address them.	Michaela Cosijn	Completed. To be updated during 2018, as the gender strategy evolves and new opportunities emerge.
6	Review indicators to ensure they are covered all the intended changes in the results chain boxes and "SMART," with a clear unit of analysis.	Yustika Muharastri	Completed
7	Review the indicators in the MRM plan to ensure that for each actor there are qualitative indicators assigned to assess how and why/why not key behavioural changes have happened.	Yustika Muharastri	Completed
8	Compile and summarise the findings in the note column in the actual tab of the ISD.	Yustika Muharastri	Completed
9	Review the sustainability indicators to ensure that for each actor in the business model there are at least one relevant quantitative and one qualitative indicators defined to assess the likelihoods of sustainability.	Yustika Muharastri	Completed
10	Identify and document relevant information needs in the gender section of the ISD.	Michaela Cosijn	Completed, but to be updated during 2018, as the gender strategy evolves and new opportunities emerge.
11	Identify the key drivers of the access numbers and start projecting from there.	Yustika Muharastri	To do as part of the Research Institute workshop in February 2018
12	Continue to closely supervise field data collection and ensure that the data collected are accurate and complete.	Yustika Muharastri	To be implemented for all field surveys until the end of ARISA.
13	Plan to collect baseline information on a timely manner in order to minimise recall bias.	Yustika Muharastri	To be implemented for all field surveys until the end of ARISA.
14	Review and revise monitoring plan to ensure that the monitoring information is collected on a timely manner and integrated into research institutes' data collection plan.	Yustika Muharastri	To be implemented for all field surveys until the end of ARISA.
15	For beef intervention, triangulate results from impact assessment with other studies of adoption of the same technology if available. For the future impact assessment, conduct DiD on annualised rearing cycle rather than cattle sold.	Yustika Muharastri	To be implemented during the next scheduled impact assessment for beef in 2018.

16	For shallot intervention, review the criteria to define the adopter whether it is appropriate. For the future impact assessment, ensure that baseline data is collected on a timely manner.	Yustika Muharastri	To be implemented during the next scheduled impact assessment for shallot IPM in 2018.
17	Fully implement the system to monitor unintended effects.	Yustika Muharastri	To be implemented for all field surveys until the end of ARISA.
18	Develop the planned AAER outline the pathway of intended systemic changes in the ISD.	Rob Caudwell	To be done during Quarter 1, 2018.
19	Review the actual AAER to ensure that the definitions used in each quadrant are in line with AIP manual.	Rob Caudwell	Completed
20	Improve the structure and documentation of review meetings.	Michaela Cosijn	To be implemented for all review meetings until the end of ARISA
21	Review the roles and responsibilities as well as QA system outlined in the AIP MRM manual to see whether it is applicable to ARISA and revise it if necessary.	Rob Caudwell	Completed

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Appendix 3: ARISA KPIs and Indicators relating to Innovation

Changes in ‘innovation capacity’ of: (1a) research institute intervention teams and (1b) targeted research institute faculties – notes on framework and scores.

Innovation capacity encompasses ‘traditional’ skills in the production of knowledge as well as a less tangible range of skills and practices that support how knowledge is embedded within enterprises (including agriculture) and society more generally, and put into use. The emphasis on research into use inevitably brings in a range of non-research partners, including the private sector.

In ARISA, measurement of changes in innovation capacity will focus on changes in capacity across two levels: (a) research institute (RI) intervention teams and (b) faculties targeted RI’s involved in ARISA. Targeted universities include the University of Jember and University of Mataram. The decision to look at these two levels of change was driven by the immediate effort in ARISA to support and build the capacity of research teams but acknowledges the longer term ambitions of ARISA to support change within the research sector. The framework for measurement of KPI 1a and 1b, including indicative rationale for assigning scores, is summarised in Table 1 and 2 respectively.

At the team level, tracking change in capacity to innovate considers focuses on the **nature of the research-private sector engagement** to support particular goals along a spectrum from **transactional** to **transformational**. This classification blends classifications of participation⁴ with types of partnership. This is not to suggest that a transformational partnership is always required - the type of partnership should be matched for purpose and problem at hand. However our contention in ARISA is that to foster agricultural innovation, something beyond transactional partnerships is required. For example, transactional relationships may be suitable where the private sector is seeking assistance in simple problems, such as checking quality of feed product sold to dairy farmers; to address the systemic barriers for increasing dairy production, a collaborative or transformational partnership is more appropriate. These types of partnership are also less common for most of the ARISA intervention partners, who have, with some exceptions, typically experienced contract based public-private relationships in the past. It is also important to note that, although a partnership fundamentally involves at least two actors, in ARISA we are focusing primarily on building capacity within the research institutes, rather than the private sector. The allocation/scoring for KPI 1a therefore focuses on the RI side of the partnership, and the ‘theoretical’ capacity of the RI, rather than the health of the partnership per se. The ARISA interventions are used as demonstrative case studies to determine this theoretical capacity.

At an organisational level, increasing capacity to innovate may require changes in organisational policies, management systems, and incentives. Increases in capacity are likely to be context specific depending on the specific RI/PS organisational settings, however example indicators could include: changes to **professional incentives** that encourage collaboration across research institutes and private sector organisations; established **routines for engagement/communication** between research institutes and private sector organisations; **expanded networks/connections** between private sector and research organisations; and reframing of research in a **market perspective**.

Given the range of potential indicators discussed above, assessment of change in innovation capacity at an organisational level will focus on changes in **routines for engagement** with the private sector, loosely based

⁴ Biggs (1989) Resource-poor farmer participation in research: A synthesis of experiences from nine National Agricultural Research Systems. OFCOR Comparative Study Paper, vol 3. International Service for National Agricultural Research, The Hague.

on a maturity model⁵ approach. Each level characterises the nature of research-private sector engagement, based on how organisational processes support particular goals (in this case, increasing innovation capacity). By ‘**routines for engagement**’ we mean the way in which the team members / RI seek to establish, maintain and improve the ways in which they communicate and collaborate with the PS. More than quantifying the number of partnerships, this indicator seeks to consider how RIs engage with the PS to increase the number and depth of partnerships. The levels and scoring in the maturity model therefore distinguish between the nature and quality of how this engagement happens. We focus on routines for engagement as, where these are mature and work effectively, there is an implication that the other aspects of capacity must also be present. For example, if the research institute has established routines for engagement, it is likely there is a shift towards professional incentives that encourage participation.

Information to determine the level and scoring for these KPIs will be collated from a range of sources, including innovation logs, partnership reflections and observations of CSIRO team members. Individual assessments will be made and documented for each RI, and aggregated to reflect an overall summary for ARISA. The requested timeframe for updating these indicators from DFAT is at a 6 monthly interval, however these sorts of changes can take several years to develop and change may not always be apparent within such short timeframes.

Table 1: Scoring framework for KPI 1a (team level)

<u>Type of partnership</u>	<u>Description / Features</u>	<u>Weighting</u>	<u>Scoring rationale (1-3)</u>
<i>Transformational</i>	<p>These partnerships are oriented for system-level changes in policy and practice.</p> <p>Problem definition and design of actions is shared by RI and PS partners via deliberative processes – both are equal drivers of the partnership.</p> <p>Partnership extends beyond projects to strategic, long term relationship.</p> <p>Partners have equal stake in the partnership.</p> <p>Activities of research institutes support adaptive management and learning.</p>	3	<p>Scoring (1-3) based on the extent to which the RI side of the partnership is reflecting the qualities of the type of partnership.</p> <p>Using ARISA interventions as a case example, these determinations are based on the demonstrated capacity of the RIs, rather than the health of the actual partnerships.</p> <p>For example, an ARISA partnership may be ‘transactional’ however if the RI through the course of ARISA demonstrated a change in practice, or how they view/think about partnerships that indicates a shift towards consultative partnerships, then they would be ranked as consultative, regardless of the health of the ARISA partnership.</p>
<i>Collaborative</i>	<p>Influencing individuals, organisations and systems</p> <p>RI and PS collaborate to define problems, goals and research process.</p> <p>Each has distinct, active role/contribution based on relative strengths.</p> <p>Research institutes engage in the experiments/research questions of the private sector.</p>	2	
<i>Consultative</i>	<p>Consultation between RI and PS about problems and solutions.</p> <p>RI activities focus on supporting PS goals with less direct involvement of PS in driving implementation/activities.</p>	1	

⁵ <http://cmmiinstitute.com/>

<u>Type of partnership</u>	<u>Description / Features</u>	<u>Weighting</u>	<u>Scoring rationale (1-3)</u>
	The role of research extends to surveying and diagnosis of systemic issues rather than focus on agricultural technical fix.		
<i>Transactional</i>	Partnership focuses on practical solutions to clearly defined problems PS contracts RIs (either individuals or teams) to provide specific, transaction-based services. The role of research is limited to testing and/or verification of technology. Engagement/communication is limited to the scope and terms of the contract.	0	

Table 2: Maturity model and scoring framework for KPI 1b (University level)

<u>Routines for engagement</u>	<u>Description</u>	<u>Weighting</u>	<u>Scoring rationale (1-3)</u>
<i>Optimising</i>	Routines for proactive engagement with the private sector are established and subject to reflection and continuous improvement. With channels established, Optimising refers to an ongoing process of learning and improvement within the RI – that is, processes are revised and improved in response to changing external and internal environments, new opportunities etc. At this level, engagement with the private sector is part of core business and habit.	6	<ol style="list-style-type: none"> 3. Mechanisms demonstrate improved performance ratings year on year. 2. Established mechanisms are subject to regular performance review including client satisfaction surveys 1. Mechanisms to engage with the private sector are established. Review is internally focused.
<i>Established</i>	The research institute has established one or more channels for regular engagement with an expanding range of private sector players that lead to collaboration and has set performance targets. This level essentially refers to the institutionalisation of mechanisms tested under <i>Piloting</i> . It indicates that one-off events have been incorporated into regular RI practices.	5	<ol style="list-style-type: none"> 3. The RI regularly uses mechanisms to explore opportunities to work with the private sector and this is used to develop new funding proposals. 2. The RI articulates in strategy documents its desire to engage the private sector through specific mechanisms, resources are allocated to these mechanism and quantitative targets are set 1. Previously piloted event is continued
<i>Piloting</i>	Research institute begins to take a more strategic approach to partnerships, testing mechanisms to promote the value of research to private sector partners and identify collaborative opportunities. Distinct from <i>Demonstration</i> , in <i>Piloting</i> , the RI is thinking beyond project-based partnerships to the processes of how it attract and foster partnerships with the private sector. It is communicating beyond “what we can do for you in this	1	<ol style="list-style-type: none"> 3. Pilots a number of events or actions to engage the private sector, in addition to ARISA-fostered events. 2. The RI undertakes at least one event, outside of ARISA activities, to explore with the private sector opportunities for

<u>Routines for engagement</u>	<u>Description</u>	<u>Weighting</u>	<u>Scoring rationale (1-3)</u>
	project” to “here is the value of our research to your business”.		partnership beyond the scope of special project funding 1. The RI, through ARISA, undertakes one event to explore private sector opportunities for partnership beyond the scope of project funding.
<i>Demonstration</i>	Special projects promote engagement with a narrow range of private sector partners based on past individual relationships, supported by the RI but externally driven as a condition of funding or project approval. In <i>Demonstration</i> , RIs have prioritised working with the private sector, however their experience in doing so as an institution (distinct from through individuals in <i>Ad hoc</i>) is limited and engagement is project driven / on a project by project basis. This level could be considered a ‘testing of the waters’ from a RI perspective to demonstrate the potential value and benefits of working with the private sector in practice.	1	3. The RI actively seeks a range of projects that include partnerships with the private sector as a central premise. 2. The RI has one additional project with the private sector, and is seeking others. 1. Only ARISA project mandates partnership
<i>Ad hoc</i>	Engagement is driven by individuals within the RI, therefore narrow and selective. Where collaboration occurs it is likely to be contracted to individuals rather than directly with the research institute.	0	Weighting is zero so no need to score
<i>None</i>	No practice of engagement with private sector at RI level.	0	Weighting is zero so no need to score

NB: The bottom 4 weightings reflect limited change beyond ARISA activities The upper 2 however do indicate that something is happening beyond ARISA activities. Scoring indicates the relative “depth of the change”.

RI – Research Institute

General comments, Dec 2017:

Overview KPI 1a: Increased capacity of RI intervention team

At the commencement of ARISA, partnerships with the private sector were mostly limited and characterised by individual contracts/fee for service. The framing of partnerships and skills of the RI teams were skewed towards the requirements of traditional research projects, or contract-based fee for service to private sector companies. Two exceptions were the Cassava intervention, where the partnership extends back to 2008, and the company was established with the purpose of fostering the emerging industry defined by UNEJ; and ISRI, where the mandate of the institution has been to serve industry, but where ISRI is struggling to change the modes of partnership from Consultative to a longer-term collaboration with industry. While the UNEJ partnership has continued to evolve, expanding to integrate sheep production into cassava processing, ISRI has faced challenges maintaining private sector interest in the partnership.

Since the activities in ARISA have started, strong organisational culture differences between the RI and PS partners has become evident. Most notably, the profit-driven nature of the PS has been a key challenge for the two UNRAM teams and ISRI. In these three partnerships, external market forces have negatively impacted on the PS partner’s capacity, if not interest, to be involved. However, in each case the RI teams have negotiated alternative arrangements: looking for new partners (UNRAM-Maize and ISRI successfully; UNRAM-Beef in progress); or brokering policy changes to support market strengthening, which in itself is a form of collaborative partnership with the private sector, government and community stakeholders

(UNRAM-Beef). Though difficult, this re-negotiation is evidence of a changing capacity within the RI teams and is likely to lead to greater sustainability of the innovation.

The 'new confidence' to engage with the private sector reported in June 2017 has continued to build in this reporting period. For UNRAM-maize, the success of the partnership and business model has spurred expansion to Sumbawa, while ISRI have successfully engaged with a new private sector partner, in both cases teams have demonstrated partnering capacity without direct ARISA support. Price fluctuations continue to present challenges for UNRAM-beef and UNEJ. Despite these challenges, the UNRAM-beef and UNEJ teams continue to look for ways to adapt and expand their partnerships. The UNBRAW-Nestlé partnership remains at a 'transactional' level, however technical assistance to Nestlé has expanded to include financial management training. This demonstrates an ability to respond to changing needs within the partnership and RI team, with support from ARISA.

Overview KPI 1b — Increased capacity of research institute, Routines for Engagement

At the start of ARISA, RIs were generally encouraging of staff to engage with the private sector. However this has largely been unsupported and has relied on contract-based work and the researcher's own networks. Initially ARISA had an events-based focus to support piloting of different routines for engagement, eg. re-designing the Jember Innovation fair to facilitate or 'match make' between private sector needs and research institute capabilities.

This focus shifted with the focus within UNEJ and UNRAM to establish intermediation units to improve engagement and collaboration with the private sector, with ARISA providing a range of training and guidance on strategy and models for private sector engagement, management of intermediation units (HR, finances, core capabilities) and supporting strategic planning.

The successful launch of the UNEJ intermediation unit, and emerging collaborations with new industries (palm oil, eco-tourism, coffee) is a significant achievement for UNEJ and ARISA. Plans within UNRAM have been delayed due to the process of electing/appointing a new rector. It is expected UNRAM's plans will progress once the appointment has been finalised.

KPI 2: Progress toward establishing policy dialogue mechanism to engage in learning from innovation at the RI-PS interface (qualitative description).

This semester has seen significant progress in the partnership with Ristekdikti, which centres on programs relating to the establishment of intermediation offices within Indonesian universities. Formal capacity building activities, such as the study-tour to Australia, have been complemented by the opportunity to share insights from other ARISA activities, in particular the experiences of UNEJ in establishing their own intermediation unit. A plan of activities and outputs has been agreed with Ristekdikti, which include mechanisms to inform review of regulations governing intermediation units, as well as a roundtable event to foster strategic dialogue between RISKTEKDITKI, industry and research institutes.

Detailed comments, KPI 1a and 1b, Dec 2017

***A note on scoring:** The progression of the UNRAM-Maize team from 'consultative' to 'collaborative' in the maturity model highlighted a problem with the framework for scoring. In June 2017, the total score for the maize team was 3 (Consultative, weighted 1 x a score of 3 = 3). In Dec 2017, under the original framework, the score would be 4, despite a substantive shift to the collaborative mode of partnership (Collaborative, weighted 2 x score of 2 = 4), which does not appropriately reflect the progression of the team (and under other scenarios, may show a negative score). As such, the scoring is now cumulative. That is, where teams progress to an additional level in the framework, scoring from the previous level is carried over. Scores for UNEJ (who started at *collaborative*) have been revised to reflect this revision.

DATA TABLE KPI 1a: Increased capacity of RI intervention teams

	Type/justification	Weighting	Score	Total	Change	Estimated change attributed to ARISA
MAIZE-UNRAM						
Dec-17	<p>Collaborative: The UNRAM team have demonstrated capacity to engage and collaborate with an increasing number of partners. The continuing interest from agri-input providers and the banks indicates the partnership, and specifically the work of the UNRAM team, is influencing individuals and organisations, and has the potential to change the system in project areas of Lombok and Sumbawa.</p> <p>We have estimated 50% of the change can be attributed to ARISA, due to ARISA's role in building the capacity of the UNRAM team and, along with SAFIRA, supporting UNRAM to identify partners to provide credit. However some of the change is also due to the drive and commitment of the project leader and broader team.</p>	2	2	7*	4	2
Jun-17	<p>Consultative: There is good evidence of expanding relationship with Syngenta approaching UNRAM to increase their activities and additional banks becoming interested in the model.</p> <p>UNRAM team self-assessment: consultative to collaborative</p>	1	3	3		0
Dec-16	<p>Consultative: UNRAM have entered into partnership with Bank NTB to support financing arrangements. It is still early in the partnership and trust is being built between the Bank and farmers.</p>	1	3	3		0
Jun-16	<p>Consultative: UNRAM team and Syngenta in close consultation to try and find solutions to financing; UNRAM's diagnosis of the system has shifted from a focus on maize/technology to the broader financial system.</p>	1	3	3		2
Base-line Sep. 2015	<p>Transactional: Some experience with private sector via individual contracts and project-based work. Past experience with Syngenta limited to field trials/provision of inputs.</p>	0	-	0	NA	
BEEF – UNRAM						
Dec-17	<p>Consultative: UNRAM's efforts to engage additional companies continue but are limited by the low demand for beef. Parallel efforts with West Sumbawa District government to develop supportive policy mechanisms yet to come to fruition. Though we have kept the scoring for the team the same this semester, it is worth noting that, overall, they work across multiple partnership types, depending on the context. For example, collaborating with a range of stakeholders on the Sumbawa Beef Roadmap; the partnership with Pt Dharma is consultative but limited by market drivers; while the partnerships with PEPEHANI are largely transactional.</p>	1	3	3	0	
Jun-17	<p>Consultative: Partnership is not yet collaborative but UNRAM team is taking concrete steps to bring a broader set of private partners together (facilitating meetings with Pt RNI and Pt Berdikari); and conducting a market study of the value chain from Sumbawa, this demonstrates increasing capacity to engage with the private sector.</p>	1	3	3	1	1

	Type/justification	Weighting	Score	Total	Change	Estimated change attributed to ARISA
UNRAM team self-assessment: consultative						
Dec-16	Consultative: The partnership with PT Dharma has continued to be challenged by market conditions. UNRAM have driven successful policy engagement activities with the long term aim of creating more conducive business environment (meat branding and certification). They are also exploring new private sector partnerships with larger companies who have a greater capacity to wear financial loss in the short term.	1	2	2	0	0
Jun-16	Consultative: Through partnership with PT Dharma, UNRAM team have shifted from limited contracts and traditional technological framing of research (increasing production) to consider systemic challenges (market development). They are seeking to diversify the partners they are working with. UNRAM is driving activities and policy engagement.	1	2	2	2	2
Base-line Sep. 2015	Transactional: Limited prior experience with the private sector, except through individual team members who are contracted for specific services.	0	-	0	NA	
CASSAVA – UNEJ						
Dec-17	Collaborative: Continued good engagement and expansion of activities in response to falling/low MOCAF price, such as tape production. Perhaps one of the big challenges for UNEJ to move from collaborative to transformational is the dynamics and capacity within the private sector. For example, the tape producers are small/micro-businesses and are unlikely to have the interest or capacity to work at that level.	2	3	9*	0	0
Jun-17	Collaborative: Strong relationship with PT BCM continues. The major challenge is demands on key personnel as interest grows and activities expand (eg. expansion to Bondowoso, interest from Nigeria and India)	2	3	9	0	0
UNEJ team self-assessment: between collaborative and transformational						
Dec-16	Collaborative: UNEJ have expanded activities to include sheep traders.	2	3	9	0	0
Jun-16	Collaborative: UNEJ team collaborate closely with PT BCM. Roles are distinct, and partnership activities are driven by UNEJ. UNEJ are seeking to diversify the range of partners they are working with.	2	3	9	0	0
Base-line Oct 2015	Collaborative: UNEJ team collaborate closely with PT BCM. Roles are distinct, and partnership activities are driven by UNEJ.	2	3	6	NA	NA
SUGAR – ISRI						
Dec-17	Consultative: Some challenges with PTPNX continue, however ISRI has successfully expanded the partnership to include a new partnership with PTGMM. Within this partnership, ISRI are working with PTGMM to identify products that have potential to benefit/engage women, and as such are negotiating/balancing RI-PS agendas and priorities.	1	3	3	1	0.5
Jun-17	Consultative: Continued commitment between ISRI and PTPNX. PTPNX	1	2	2	0	0

Type/justification	Weighting	Score	Total	Change	Estimated change attributed to ARISA
seem to have re-engaged. Potential interest from PT GMM to collaborate on brown sugar.					
ISRI team self-assessment: Collaborative					
Dec-16 Consultative: PTPNX showing decreased interest/commitment in partnership due to market dynamics. ISRI have started looking at alternative companies and partnerships.	1	2	2	0	0
Jun-16 Consultative: Well established partnership between ISRI and PTPN X based on historic ISRI role. ISRI struggling to engage PS in more strategic partnership with greater sharing of resources. Role of University is as contracted service provider.	1	2	2	0	0
Base-line Dec. 2015 Consultative: Well established partnership between ISRI and PTPN X based on historic ISRI role. ISRI struggling to engage PS in more strategic partnership with greater sharing of resources. Role of University is as contracted service provider.	1	2	2	NA	NA
DAIRY – UNBRAW					
Dec-17 Transactional: UNBRAW technical assistance to Nestlé has expanded to include financial management training. This demonstrates an ability to respond to changing needs within the partnership, with the support of ARISA. The weighting of this level as zero hides changing capability within the RI team.	0	1	0	0	0
Jun-17 Transactional: There is a lot of enthusiasm in UNBRAW and confidence at working with the PS, however there is still limited evidence that the partnership has evolved to be more consultative. Part of the challenge has been the time constraints and dependence on the lead researcher at UNBRAW to facilitate the relationship.	0	0	0	0	0
UNBRAW team self-assessment: consultative to collaborative					
Dec-16 Transactional: The partnership has clear activities and responsibilities for each partner. There is potential for this to evolve into a more consultative partnership which leverages these activities for greater impact, but as yet there is limited evidence that this has occurred, with each partner focusing on their own activities.	0	0	0	0	0
Jun-16 NA - too early for change	0	-	0	0	
Base-line Mar. 2016 Transactional	0	-	0	NA	NA
ARISA OVERALL					
Dec-17 Progress and developments in the intervention teams in the last 6 months reflect the growing maturity/established nature of the partnerships. For maize, success in the partnership and business model has spurred expansion, while Sugar has successfully engaged with a new private sector partner, in both cases demonstrating partnering capacity without direct ARISA support. Beef and Cassava have demonstrated innovate strategies and efforts to expand their partnerships and foster systemic			22	5	2.5

	Type/justification	Weighting	Score	Total	Change	Estimated change attributed to ARISA
	change, however have faced challenges in market dynamics and the capacity of private sector partners.					
Jun-17	Many of the RI teams are demonstrating a new confidence and ability in engaging with the private sector, as indicated by their self-assessment scoring. This is not always reflected in the overall scoring here, which refers instead to the nature of their partnership with their PS partner in ARISA. The health of the maize and cassava partnerships are indicated by the interest from the private sector to expand the areas the partnerships are operating in. While for beef, maize and sugar, the RI teams are continuing to adapt and expand their partnerships, looking for new opportunities to overcome challenges or take advantage of emerging opportunities.			14	1	1
Dec-16	Though the RIs are working hard within many of the partnerships to manage the dynamics of working with the private sector, we do not expect that this translates to substantial changes in the partnerships within a 6 month timeframe. (i.e. this is on longer time cycles and we would expect to see changes in the next reporting period.)			13	0	0
Jun-16	2/3 RIs that were originally 'contractual' can be considered to have shifted to 'consultative' with a much broader view of the research/development challenge to consider market, finance and other systemic problems. For ISRI and UNEJ, who had deeper/more mature partnerships at the commencement of ARISA, the degree of change is less visible.			13	5	4
Base-line	At the commencement of ARISA, partnerships with the private sector were mostly limited and characterised by individual contracts/fee for service. Two key exceptions were the Cassava intervention, where the partnership extends back to 2008, and the company was established with the purpose of fostering the nascent industry defined by UNEJ; and ISRI, where the mandate of the institution has been to serve industry, but where ISRI is struggling to change the modes of partnership from Consultative to a longer-term collaboration with industry.			8	NA	NA

DATA TABLE KPI 1b: Increased capacity of RI — Routines for Engagement

	Type/justification	Weighting	Score	Total	Change	Estimated change attributed to ARISA
UNEJ						
Dec-17	Established: In the last 6 months the UNEJ Intermediation Unit was launched and partnerships with companies in ecotourism, palm oil and coffee are being pursued in addition to the existing (and expanding) partnerships in cassava. Establishment of the unit came undoubtedly from a strong internal push within the university. However ARISA has supported UNEJ in developing a strategy and business plan for the IU, and in particular helped the UNEJ to understand different models and options for how the unit can engage with the private sector.	5	2	13*	10	6
Jun-17	Piloting: UNEJ continues to collaborate with ARISA on establishment of intermediation units as a way of facilitating improved engagement with the private sector.	1	3	3	0	0
Dec-16	Piloting: Work with UNEJ has been complemented by a broader strategic plan for business engagement units, which is being developed in readiness for UNEJ's transition to semi-autonomous university in early 2018	1	3	3	1	0
Jun-16	Piloting: Through ARISA activities, university is experimenting with different format of Innovation Fair to facilitate dialogue between research and private sector.	1	2	2	2	2
Baseline	Demonstration: UNEJ is seeking ways to engage with the private sector, such as through the annual Innovation Fair. However current design of activities focuses on showcasing / promoting university achievements rather than facilitating dialogue with the PS.	0		0	NA	NA
UNRAM						
Dec-17	Piloting: UNRAM continues to work with ARISA to establish an intermediation unit. However progress has been slowed due to the election of a new rector.	1	1	1	0	0
Jun-17	Piloting: UNRAM is collaborating with ARISA to establish more formal mechanisms to engage with the private sector (intermediation office), which demonstrates strategic thinking beyond project-based partnerships	1	1	1	1	1
Dec-16	Demonstration: UNRAM has continued to show strong interest in mechanisms to engage with the private sector but this has not yet translated to strategic direction within the university.	0		0	0	0
Jun-16	Demonstration: UNRAM has some projects with the private sector in addition to ARISA, and is seeking ways to engage with the PS more formally. However mechanisms to support engagement are lacking.	0		0	0	0
Baseline	Demonstration: UNRAM has some projects with the private sector in addition to ARISA, and is seeking ways to engage with the PS more formally. However mechanisms to support engagement are lacking.	0		0	NA	NA
ARISA - OVERALL						
Dec-17	The successful launch of the UNEJ intermediation unit, and the promising collaborations with new industries is a significant achievement for UNEJ and ARISA. It is hoped UNRAM's plans will progress once the appointment of the new rector has been finalised.			14	10	6
Jun-17	Both UNEJ and UNRAM have shown strong commitment to establishing/formalising mechanisms to link with the private sector in a more strategic way. Planning has been underway for at least the last 6 months, and it would be			4	1	1

	expected further change is visible as these are implemented in the coming year.			
Dec-16	Change in UNEJ has stemmed from organisational priorities, which ARISA is supporting, but cannot claim attribution for. In both UNRAM and UNEJ, the processes for changing capacity and methods for engagement are slow processes, with greater change anticipated in the next reporting period.	3	1	0
Jun-16	ARISA is trialling new ways to engage with the private sector such as through the targeted redesign of the Jember innovation fair to directly facilitate or 'match make' between private sector needs and research institute capabilities. Trials will be expanded in the future.	2	2	2
Baseline	Ris encourage staff to engage with private sector and there are some projects, however limited support is provided to staff to support engagement with private sector beyond promotion of achievements.	0	NA	NA

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Appendix 4: Theory of Change: Innovation systems activities and long term institutional change

ARISA Team, December 2017

This document sets out the theory of change linking current ARISA activities with broader goals for institutional change in Ristekdikti and partner universities. Though prepared in response to an SRP request, it has been a timely activity for the team as the Ristekdikti partnership gains momentum, and the capacity building and research activities start to converge on sharing of lessons learned.

There are two broad ARISA program objectives:

- Productivity and income increases for 10,000 smallholder farmers; and
- Increased capacity of research institutes and private-sector to partner for smallholder-relevant innovation.

These two objectives are linked, with increased capacity for research-private sector partnerships (potentially) supporting more inclusive innovation that benefits smallholder farmers, and contributing to sustainability of innovation after ARISA ends. This theory of change focuses on the second outcome and associated activities: partnership with Ristekdikti to support capacity in program design, implementation and evaluation; capacity building of research institutes through the establishment of intermediation units; and analysis of current partnerships to derive insights on RI-PS collaboration that feed into other activities. Figure 1 provides a detailed overview of the ARISA theory of change, with a focus on these activities and links to the broader program objectives.

(a) Partnership with Ristekdikti to support strengthened capacity to design, implement and evaluate schemes that support RI-PS collaboration for agricultural innovation.

Long-term, institutional changes that create a more enabling environment for research-private sector partnerships and innovation are required in Indonesia. This applies at multiple scales, such as the legislation and regulatory environment and support programs that are set by Ministries; university roles and academic incentive schemes; and the structures that support (or inhibit) researchers in strategically engaging and building partnerships with industry.

These sorts of deep changes must be driven domestically, and represent fundamental changes in how government agencies and programs are structured, monitored and incentivised. It is a long-term change agenda, and ARISA recognises it is one (small) actor working to support Indonesian agencies with these changes. Within the timeframe and scope of ARISA, our goal is therefore to build capacity of key actors within the Directorate of Industry Innovation, with the aim of setting foundations for longer-term change. After a partnership between ARISA and Ristekdikti was formalised in late 2016, the team have been working with Ristekdikti to understand the key needs, priorities and realistic areas where capacity can be built.

These activities started broadly, with a *workshop on different models of research and industry collaboration, based on international best practice* (Feb 2017). This workshop helped ARISA to understand

the existing capabilities and programs within Ristekdikti, and highlighted the potential to strengthen capabilities and experiences in strategic planning, monitoring, evaluation and learning approaches to inform adaptive program management and design of schemes designed to support university-private sector partnerships, in particular intermediation offices. Feedback from the workshop was positive, and a subsequent request has been made for a synthesis document that summarises key approaches and lessons based on the workshop. This is currently under preparation.

Two study tours build on this workshop. The first, which brought key actors from Ristekdikti to Australia (Dec 2017), sought to provide participants with the opportunity to understand Australian RI-PS schemes from the perspective of Universities (UQ, ANU) and key Australian Government Agencies. Though the earlier workshop provided insight into practical schemes, the study tour provided the opportunity for participants to examine the Australian innovation system—policy and implementation from various perspectives. Feedback from the study tour participants indicated the contrast between the Australian and Indonesian system was useful in highlighting potential areas for change within Indonesia, such as the need to work more cooperatively across agencies, and to focus on impact, as well as traditional research metrics in assessing applications for Ristekdikti support.

A second study tour is planned for February 2018 to consider the Indonesian innovation context. It brings together members of the Ristekdikti partnership, staff from the University of Mataram (UNRAM) and University of Jember (UNEJ), and ARISA team to visit successful, established intermediation offices in other universities. Both UNEJ and UNRAM are in various stages of establishing their own intermediation units. The study tour provides an opportunity for UNEJ, UNRAM to learn from the experiences of other universities, and observe the various mechanisms and options available for RI-PS engagement. It likewise provides Ristekdikti with the opportunity to observe the practical implementation of intermediation units as a result of current policy, and to understand some of the challenges and opportunities to support universities like UNRAM and UNEJ in building their institutional capacity to support RI-PS collaboration.

These lessons and insights will be co-developed by ARISA and Ristekdikti, with input from the universities into a set of guidelines for the design, establishment, monitoring and evaluation of intermediation offices within Indonesian universities. This has the benefit of strengthening networks within Indonesia, and allows for a guided process to refine and co-develop and implement guidelines for continued expansion of intermediation offices. This is a small step towards improving the incentive schemes for research, private sector partnerships. These guidelines will be used by the Directorate of Industry Innovation in the current review of regulations governing the establishment of intermediation offices, with the aim of creating a more enabling, conducive environment for research institutes to access support and design schemes based on best practice for the Indonesian context. Whilst this is modest change within the Indonesian innovation system, it provides a concrete example of “influencing the influencer” sought by the SRP in its commentary from the SRP meeting in September 2017.

Finally, a roundtable is planned for late 2018, which brings together Ristekdikti, RIs and the private sector to discuss implications of the experience in ARISA for policies, incentives and regulations and open a strategic dialogue to support RI-PS engagement.

(b) Partnership with UNEJ and UNRAM to establish intermediation offices as a way of supporting organisational structures, policies and incentives to encourage researchers to collaborate with the private and community sector to apply new and existing research and technology.

Both universities are in the process of establishing intermediation offices to support strategic engagement with the private sector. At the start of ARISA, engagement with the private sector was ad-hoc, and usually driven by, or dependent on the networks and motivation of individual researchers. The establishment of intermediation offices will, over time, support a more strategic approach to private sector engagement and more focused support around commercialisation processes (patenting, etc).

Activities in ARISA have/are contributing to the design and establishment of intermediation offices through: comparative advantage studies that identify university strengths in the context of business needs in the province (2017); support in planning, monitoring, evaluation and learning (ongoing) and specialist capacity building (ongoing).

To date, these activities have contributed to intermediation unit planning and design that is feasible, realistic and appropriate to the goals and resources available. In the case of UNEJ, which had begun planning prior to ARISA support, capacity building provided by ARISA highlighted alternative models and strategies to support private sector engagement beyond start-up or spin-off companies.

The planned February 2018 study tour will further support these capacity building efforts, providing UNRAM and UNEJ a chance to discuss the planning and operation of intermediation units with other universities and learn from their experiences.

Another important cross-cutting activity that links to the partnership with Ristekdikti, is support to UNEJ in the design and implementation of a Planning, Monitoring, Evaluation and Learning (PMEL) system to inform the management of their intermediation office. Lessons from this experience will also directly inform the guidelines for intermediation schemes prepared for Ristekdikti and outlined above.

UNEJ launched its intermediation office (Centre for Intermediation and Innovation) in November of 2018. UNRAM has submitted a proposal for its intermediation office (Business Innovation Centre) to its Senate for approval (the process is on hold pending the election of the new Rector). Establishment of the intermediation offices provides a critical point of support within the universities to formalise mechanisms of engagement and support a more strategic engagement with the private sector that is sustained beyond ARISA. This will not prohibit individual researchers who already engage in partnerships from doing so, but critically provides resources and capabilities within the university to expand on these existing partnerships, and support researchers without links to the private sector to build these links.

(c) Building RI Team capacity to expand collaboration, initiate new research and jointly foster innovation for smallholder farmers with the private sector:

These activities are pitched at team/individuals, working in the ARISA interventions, effectively leveraging the experiences of implementing an RI-PS partnership to reflect, learn and build capacity within the teams. These activities include the partnership agreement and reflection workshops which have supported critical reflection and changes to the business/innovation models guiding some of the partnerships; targeted training to build skills in pitching to, and understanding the needs and priorities of, the private sector; and partnership management. Capacity building activities try to leverage peer to peer learning and provide regular opportunities for RI partners and key private sector representatives to discuss shared challenges, or opportunities.

This helps to build a pool of researchers within the universities that have skills and experience in private sector partnerships, but also aims to extend researchers' strategic thinking in terms of how to pitch to the private sector, how to manage and negotiation partnerships and so on.

Points for reflection, sharing of insights and learning are woven throughout these capacity building activities and are also overlap with 'formal' research activities. Monitoring of the partnerships and formal research activities (practice logs, case studies and analysis) document and analyse the mixed and varied processes of research-private sector partnerships in the interventions to draw out broader insights relating to opportunities, challenges, risks and the dynamics of partnering; and more generally the lessons learned from the grants process that ARISA followed. These lessons, insights and challenges are discussed at the annual RI workshops, and inform discussions with Ristekdikti, UNEJ and UNRAM as part of other activities outlined above.

(d) Tracking change

Frameworks for tracking progress toward outcomes are already defined for the research teams and establishment of intermediation offices (refer to innovation capacity maturity model). A broad, qualitative indicator was established in terms of influencing institutional capacity (KPI 2: Progress toward establishing policy dialogue mechanism to engage in learning from innovation at the RI-PS interface (qualitative description)).

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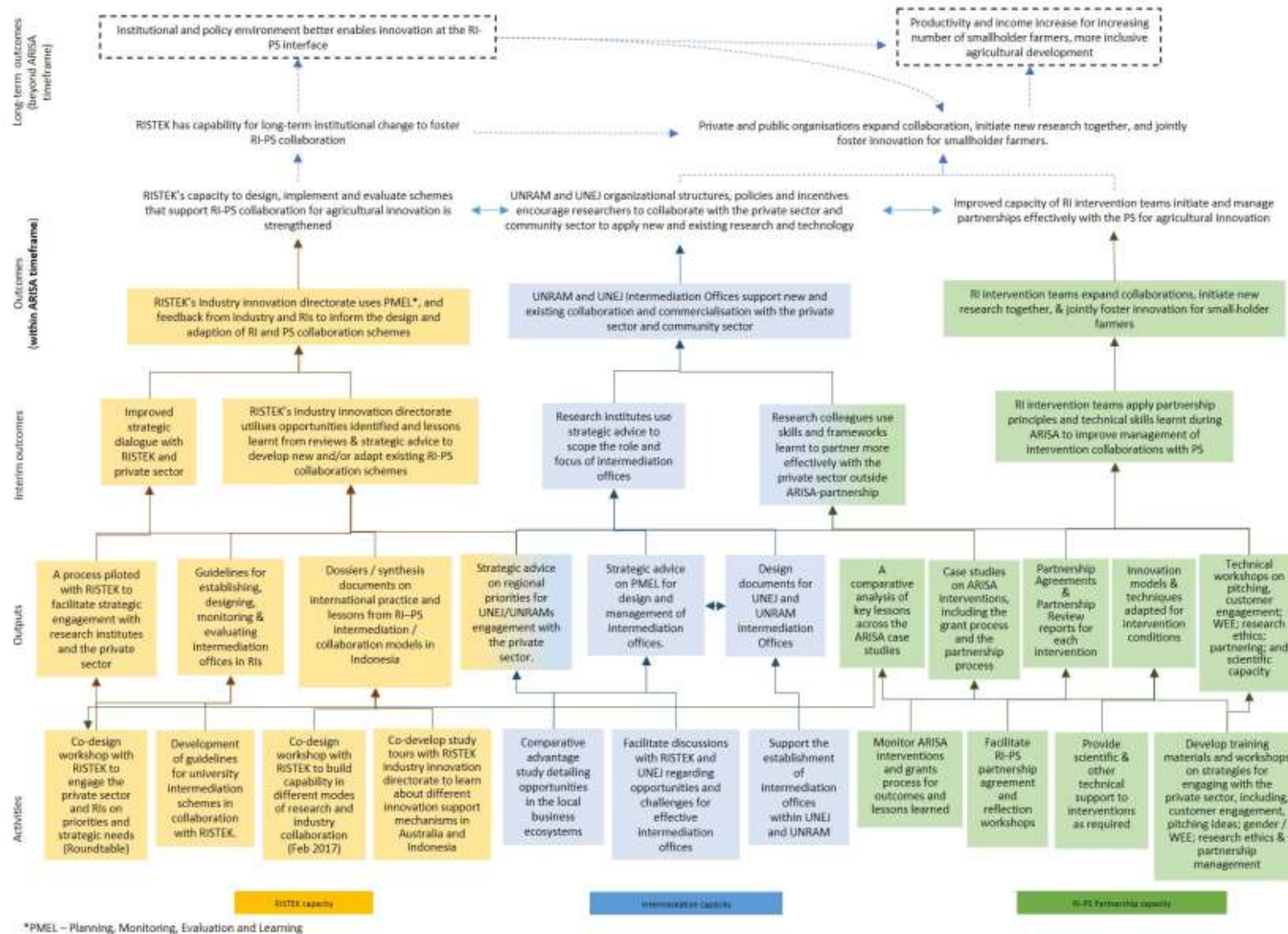


Figure 3: ARISA Theory of Change, Innovation systems and capacity building activities. Note: Arrows are indicative of connections between activities, outputs and outcomes, however to aid diagram clarity, not all connection have been included.

Appendix 5: Summary: Comparative Advantage Study for East Java and Lombok

Summary: Regional specialisation, business clusters and comparative advantage: implications for supporting innovation through private sector partnerships.

Andy Hall and Jennifer Kelly

Prepared by: Andy Hall and Jennifer Kelly

Date: January 2018

Summary of Key Findings

The key implications of the comparative analysis in East Java and Lombok for the development and support of intermediation units include the following observations:

- **Understanding role of regional specialisation to focus RI-company engagement:** Viable regional business specialisations do indeed exist and could be a valuable focusing device for the research institutions (RIs) professed desire to develop deeper engagement with the private sector.
- **Relevant expertise:** The universities have relevant expertise, but this is not necessarily around specific technologies or commodities (although it can be). Rather it relates to social and institutional innovation and often involves issues to do with market trends and predicting future directions.
- **Maturity and innovation capability of companies affects models of RI engagement:** Depending on the level of maturity and innovation capability in the regional business environment, RIs need to be realistic about the institutional purpose and logic of their proposed intermediation units and engagement with the private sector. Different institutional approaches can be part of a portfolio of offerings that the intermediation units broker to businesses depending on the private sector capacity (e.g. commercialisation of research if companies have capability. If companies have weak capacity it may be convening external platforms with a variety of business and RI stakeholders to enable the business environment, or providing technical training services, or contracted research and technical services). Tailoring different approaches to the clusters of businesses being engaged is important, and balancing this with the RIs underlying rationale (strategic intent) for seeking deeper engagement with the private sector.
- **No size fits all – creating appropriate intermediation models:** The issues of multiple institutional approaches or strategies for intermediation units need to be reflected in national schemes to support these in Universities. There is clearly no one size fits all blueprint. A spectrum of different intermediation units should be considered: some more focused on training and convening external platforms; some more focused on contract research and expert services; and some more focused on commercialisation or the creation of spin-off companies. These very different strategies will need very different policy guidelines, capabilities, and funding mechanisms.

Introduction

Knowledge intensive collaboration between public research institutes and the private sector is at best patchy in many countries, including Indonesia. Generic diagnosis of this problem suggests that this relates to a lack of market orientation on the part of researchers; a lack of familiarity on the part of private sector with the technology and expertise offering of the Research Institutes (RIs); and a misalignment of professional incentives in the research and business communities.

Considerable attention in many diagnostic studies around the world focus on the professional incentives in RIs – for example, attempts to craft performance metrics beyond publications. However, less is understood about the incentives for the private sector to be more pro-active in seeking out knowledge and technology from RIs.

In the context of Indonesia the majority of firm-level innovation makes little use of RI sourced knowledge and technology. This is particularly so in the agri-business sector⁶. Understanding the incentives and conditions that would encourage the private sector to collaborate is a key question for ARISA as deepens its efforts to find ways of supporting policy and stimulating more broad-based RI-private sector engagement.

ARISA has explored this question through the lens of a regional comparative advantage study. The logic behind this was informed by observations elsewhere that when a regional business specialisation (for example water resources development in Cyprus or horticulture in the Netherlands) becomes an organising principle for complementary investments in public research capability, education and economic development strategies and investment more generally, then the synergies created spur innovation. In other words regional specialisation or comparative advantage helps align incentives and priorities of research and business around a common area of specialisation, creating a common platform for collaboration, a critical mass of complementary research and business skills and this in turn underpins innovation.

This study investigated the business landscape around two regional universities that ARISA currently partners with: the University of Mataram (UNRAM) in Lombok and the University of Jember (UNEJ) in East Java. CSIRO visited Lombok in June 2017 and East Java in August 2017. Key institutions and companies were interviewed in each region for their insights on opportunities, needs and priorities of local industry against the core strengths and research areas of UNEJ and UNRAM. In contrast to the UNRAM study, key staff from UNEJ travelled with the ARISA team to conduct interviews with the private sector. This provided an opportunity for UNEJ staff to better understand the needs and priorities of industry in East Java first-hand and therefore contributed to capacity building efforts

The study identified emerging specialisations (ecotourism in Lombok) and established specialisations and industries (seed production and coffee industries in Jember; and eco-tourism, cattle and seaweed production and processing industries in Lombok). Some of these areas of specialisation have already benefited from significant private investment and/or strategy development.

The universities have not necessarily orientated themselves towards these regional specialisations explicitly. There are nevertheless existing bodies of research expertise in the technical, social and economic sciences in both universities that could usefully play into the clusters of business associated with identified specialisations. Yet it is also clear that there are a number of elements required before the emergence of a regional comparative advantage could start to create the incentives and mission alignment for strengthened RI-private sector alignment.

⁶ Voeten, J., Achjar, N., & M. Utari, K. (2016). Indonesia: Qualitative Study on Innovation in Manufacturing Small and Medium Sized Enterprises (SMEs): Exploration of Policy and Research Issues. Tilburg: Tilburg University.
https://pure.uvt.nl/portal/files/18329605/Report_qualitative_study_innovation_SMEs_Indonesia_2016.pdf

Key Findings

The high-level findings of the study are a sobering reality check on the magnitude of the challenge of strengthening knowledge intensive collaboration in the business landscape context of the 2 study areas. In relation to the SMEs, the issue is not the misalignment of incentives per se, but missing capabilities and preconditions needed to respond to incentives. This finding further calls into question the validity of last mile technology commercialisation perspective on RI-private sector partnerships and points to a wider set of knowledge-based collaborations needed to support innovation in the context of Indonesia. This includes contract research and technical services, but equally important, it also includes helping businesses navigate the social context of aspects of their business, community engagement and social organisation to generate impact.

For many of the individual companies interviewed – largely SME traders – the capability to engage in technological upgrading is extremely limited. In many cases, innovation would need to be addressed in a systemic way, across existing or emerging value chains (for example eco-tourism) including the policy environment. This in turn would require a degree of organisational development (collaboration platforms between stakeholders within the business ecology) and pre-competitive collaboration between businesses that is currently largely absent. This in some instances would include some form of farm-level collective production or marketing. While the technological innovations may be fairly straight forward (new inputs, or agro-processing techniques and products) the organisational and institutional changes that would need to accompany the technology change represent a complex innovation that is beyond the capability of most small-scale players in east Java and Lombok.

Opportunities for supporting wider innovation were certainly observed. For example, in Lombok, the local government investment board has selected eco-tourism as one of the key priorities for the region. Industry bodies are starting to form around this, including— the local hotel association, and the newly formed agri-business association. Engagement and collaboration by UNRAM with these bodies and the local government could provide opportunities to identify research and technology needs to support innovation through the co-development of potential farm and value chain solutions, as well as wider eco-tourism solutions.

This looks very different from the current ARISA partnership model. It is noted with caution that it would require considerable convening of relevant stakeholders and capacity building of the private sector for them to become innovation ready. Collaboration would be less focused on single technologies and commodities, but on a wider set of solutions and relationship building.

These findings concur with recent analysis by the World Bank⁷, which suggests that weak innovation capabilities (i.e. capabilities to assimilate and manage technological change) of SMEs accounts for the failure of many countries in Asia to take advantage of globally available knowledge and technology. It recommends that building innovation capabilities in SMEs is a prerequisite to other forms of technological up-grading, such as strengthening partnerships with public research institutes.

Larger-sized and technologically more sophisticated companies, while few and far between in the two regions analysed, present a slightly different picture (public sector enterprises are discussed separately). For example, *seaweed processing* companies in Lombok have been established on the back of opportunities

⁷ Cirera, Xavier; Maloney, William F. 2017. *The innovation paradox : developing-country capabilities and the unrealized promise of technological catch-up (English)*. Washington, D.C. : World Bank Group. <http://documents.worldbank.org/curated/en/844101510122107327/The-innovation-paradox-developing-country-capabilities-and-the-unrealized-promise-of-technological-catch-up>

created decades earlier by public investment aimed at popularising seaweed production as a livelihoods strategy. The company visited during the study had basic R&D capability and had developed a range of seaweed value added products based on its own expertise. However, the company was unclear what UNRAM had to offer, preferring to rely on other knowledge resources. On the other hand, at the time of undertaking the study, it was also not apparent how the University had tried to connect to local industry in response to the emergence of seaweed as a regional specialisation⁸.

This finding aligns with a recent study by the University of Tilburg on the innovation behaviour of firms in Indonesia. Its main conclusion is that in cases where “new to the firm innovation” is taking place the main source of technology and ideas is the internet and extended social networks⁹. RIs are rarely engaged as the type of upgrading that companies require can easily be sourced from publically available sources. The University of Tilburg study concludes that partnership with RI may be unnecessary and infeasible for many smaller companies, once again pointing to underdeveloped capacities in the private sector for more sophisticated forms of technological change and innovation¹⁰.

A more technologically sophisticated regional specialisation emerged around Jember in East Java, in the *seed production sector*. This is a well-established industry with large Indonesian and foreign owned companies, most with an associated network of small companies organising the production of seed through arrangements with farmers. One Indonesian company visited had a highly developed R&D capability covering plant breeding and pathology and both UNEJ and the company acknowledged that the University had little to offer in terms of plant breeding expertise. However, in the area of tissue culture, where UNEJ has strengths, the company acknowledge that there was potential for collaboration. This would probably be in a research and expert services mode rather than a commercialisation mode. It was surprising to note that even though Jember’s regional specialisation in seed production was quite mature, the UNEJ had not explicitly responded to this opportunity in its research priorities, despite previously sending students on internships to the company interviewed.

In a mature R&D intensive sector like seeds (recognising that these are in the minority), there are both the capabilities and incentives to collaborate with public RIs. However, the complementary research offering of the RI may not simply be upstream of the R&D focus of the company. Rather, as in this case it is an aligned area of technical expertise. Developing a type of collaboration that builds on a mature regional specialisation, requires mechanisms in place to identify complementary rather than competing areas of expertise and the capacity to articulate its value add to the company.

State-owned enterprises operating in these regions paint a slightly different picture again. These were often some of the largest companies in the area around Jember – eg. coffee and cocoa in the case of East Java. Similar to the seed industry example above, these public enterprises usually have a dedicated RI dealing with both production and post production technology. As a result the companies have few incentives to collaborate on these aspects and are highly sceptical about the feasibility of, for example, coffee related processing technologies presented by UNEJ.

⁸ In early February a workshop will be held at UNRAM on opportunities in seaweed both at a community production level through to processing for food and medical purposes. Participants will include UNRAM, CSIRO, University of Malaysia, Oxfam, ACIAR, Ministry of Industry, Ristekdikti, Bappenas and companies.

⁹ Voeten, J., Achjar, N., & M. Utari, K. (2016). Indonesia: Qualitative Study on Innovation in Manufacturing Small and Medium Sized Enterprises (SMEs): Exploration of Policy and Research Issues. Tilburg: Tilburg University.
https://pure.uvt.nl/portal/files/18329605/Report_qualitative_study_innovation_SMEs_Indonesia_2016.pdf

¹⁰ Voeten, J., Achjar, N., & M. Utari, K. (2016). Indonesia: Qualitative Study on Innovation in Manufacturing Small and Medium Sized Enterprises (SMEs): Exploration of Policy and Research Issues. Tilburg: Tilburg University.
https://pure.uvt.nl/portal/files/18329605/Report_qualitative_study_innovation_SMEs_Indonesia_2016.pdf

However interviews revealed that there are other cross-cutting topics where there is great interest in collaboration. For example, the social dimensions of adaptation to climate change, digital solutions to water management, coffee and cocoa market trends and foresights, feasibility studies, and organising community engagement. Once again, taking advantage of these complementarities and building on a comparative advantage is going to need investment in intermediation mechanism that in the long term can start to align priorities, investments and capabilities around this type of regional specialisation¹¹.

Main messages and implications for design and implementation of RI intermediation units

Findings from this study suggest that there are potential regional specialisation opportunities that could become the focal point for aligning incentives for public-private sector collaboration. Business clusters exist in a variety of stages of maturity in these regions. However, many of the recent and more promising clusters are populated with businesses with very limited capacity for collaboration with RIs and for innovation more generally. RIs have not always responded explicitly to these regional specialisation in terms of how they engage with the private sector (with the exception of beef in Lombok – not discussed in this summary).

Unlocking the incentives that regional specialisation presents for knowledge intensive collaboration requires a range of support and preconditions. There is a hierarchy of actions needed depending on the maturity and capability of the regional business specialisation, namely:

- (i) Enrolling the support of the wide range of potential stakeholders from farm to policy scales around an emerging area of specialisation and prioritising this specialisation in public and private sector investment and goals, creating visibility for the specialisation and creating the foundations for collaborative and coherent action.
- (ii) Building the capability of SMEs to deploy technology (not necessarily from research) for innovation. This will involve capacity building both in the sense of skills within businesses to manage innovation, as well as in the sense of creating collaboration platforms across value chains and with other stakeholders.
- (iii) Building the technical capability of the SME private sector to collaborate with RIs.
- (iv) Creating supporting mechanisms (grants, intermediation units and innovation acceleration programs) to encourage knowledge intensive collaboration between RI and the private sector at increasing levels of technological sophistication.

The findings of this brief study suggest that while the temptation might be to move straight to supporting RI-private sector partnerships, many of the pre-conditions (i – iii above) are not yet in place in the agri-business sector, particularly for emerging regional specialisation. There is clearly an exception to this where more mature specialisations exist, for example the seed production sector in Jember region, as discussed above. However, incentives to encourage collaborations around regional specialisations need to be tailored to prevailing conditions and capabilities.

Conversely, it could be argued innovation support schemes should simply target clusters and companies with sufficient capability. While cherry picking in this way has its advantages, in terms of potential quick wins, it doesn't address the deeper, systemic capability issues that are holding back innovation in the agri-business sector in Indonesia.

The findings also have further and perhaps paradoxical implications for ARISA and the subsequent PRISMA II, namely that rather than thinking of ARISA as a proving ground for innovations to be scaled through a

¹¹ Note on 31 January 2018, UNEJ and the State Owned Company PTPN XII, which manage rubber, coffee, and cocoa formally launched a partnership through its Centre for Intermediation and Innovation to explore how UNEJ can help address problems identified by PTPN XII.

PRISMA-like approach, perhaps PRISMA, through its more hands on support of certain businesses is creating the precondition capabilities of businesses that would allow them to graduate into more knowledge-intensive modes of collaboration with RIs and other sources of new technology. While that is contestable, it is certainly worth exploring further.

These observations have a number of implications for ARISA's on-going efforts to support the development of intermediation units in UNRAM and UNEJ, including:

- **Understanding role of regional specialisation to focus RI-company engagement:** Viable regional business specialisations do indeed exist and could be a valuable focusing device for the RI's professed desire to develop deeper engagement with the private sector. Understanding the role of regional specialisation in the more successful intermediation units in Indonesia will be valuable in determining how this organising can be leveraged in the design of new units.
- **Relevant expertise:** The universities have relevant expertise, but this is not necessarily around specific technologies or commodities (although it can be). Rather it relates to social and institutional innovation and often involves issues to do with market trends and predicting future directions.
- **Maturity and innovation capability of companies affects models of RI engagement:** Depending on the level of maturity and innovation capability in the emerging regional priority areas, RIs need to be realistic about the institutional logic of their proposed intermediation units. For example, if the main priority area is populated with SMEs with very low innovation capability, it is unrealistic to expect that revenue raising through commercialisation will be the overriding logic of an intermediation unit. In such a case, it might be more realistic to concentrate on convening external platforms with a variety of business and RI stakeholders to enable the business environment, or providing technical training services. In other cases contract research and expert technical services might be more appropriate. These different institutional approaches can of course sit in a portfolio of offerings that the intermediation unit is brokering to businesses. What is important is to tailor these to clusters of businesses being engaged and balance this with the RIs underlying rationale (strategic intent) for seeking deeper engagement with the private sector.
- **No size fits all – creating appropriate intermediation models:** The issues of multiple institutional approaches or strategies for intermediation units need to be reflected in national schemes to support these in Universities. There is clearly no one size fits all blueprint for this. What would be more useful, would be to consider a spectrum or typology of different intermediation units: some more focused on training and convening external platforms; some more focused on contract research and expert services; and some more focused on commercialisation or the creation of spin-off companies. As already discussed these are very different strategies and will in turn need very different policy guidelines, capabilities, and funding mechanisms.

Appendix 6: Intervention Case Study – Maize-Pulse

ARISA Intervention Case Study: Maize-Pulse intervention, increasing credit and input access to support smallholders

DRAFT (2) for team input December 2017

1. Summary

This case study examines a partnership between UNRAM, Syngenta and Bank NTB to provide technical support, affordable credit and inputs to maize farmers in Lombok. The partnership addresses some of the key constraints in maize production, providing access to formal credit systems to some households for the first time. Innovation in the system has depended on significant efforts in brokering and facilitation from UNRAM, with support from ARISA and SAFIRA, to ensure smooth relationships between farmers, the bank, input suppliers and government. As a result of the partnership, Syngenta has increased its standing and sales, especially in North Lombok where the government will use Syngenta hybrid maize varieties as part of its seed distribution program next year. Household increases in production and net income are also evident, despite irregular rainfall, especially in the 2015/16 wet season. Though the partnership is strong, the case highlights some questions regarding sustainability of these kinds of interventions, and how risks are shared between different partners, with UNRAM bearing a degree of reputational risk beyond that of other partners, while also bearing a significant amount of the burden of coordinating the partnership.

2. Problem and opportunity

Dryland maize farming in Nusa Tenggara Barat is characterised by low yields and vulnerability to variable rainfall. Farmers face significant challenges to access quality inputs on time and in an affordable manner. Improved maize varieties are often supplied by local collectors, who provide inputs on credit and purchase the harvest at a fixed price. However, interest charged on these arrangements is very high. Companies such as Syngenta promote improved varieties in the area, but many farmers are not able to purchase these due to cost and timely availability of seeds and fertiliser.

Researchers at the University of Mataram (UNRAM) saw significant potential to increase crop yield, and therefore income, by supporting farmers to use improved varieties and new agricultural management practices. Dual cropping of maize with pulses, in addition to improving soil fertility, also provided the opportunity to spread climate risk and diversify income. In order for these practices to be feasible for farmers to implement, issues of input access and access to credit at reasonable rates had to be resolved.

3. History of the partnership

The original partnership brought together UNRAM (research), Syngenta (global agri-inputs company) and Asia Crop Solutions (ACS, a Japanese-owned credit and input supplier). Prior to ARISA, researchers at UNRAM had worked informally with Syngenta, testing improved varieties as part of field trials, but otherwise had no formalised relationship. Syngenta had worked with ACS in 2015, when ACS provided credit to farmers so they could purchase Syngenta seed and other inputs, and farmers would then sell the maize to ACS.

ARISA provided the opportunity and funding to bring UNRAM and Syngenta together in a partnership, with a proposal lead by UNRAM. Syngenta shaped the partnership by bringing in ACS based on their past experience. UNRAM was to play multiple roles, providing technical support, conducting further research on maize and pulse production, and facilitating fair contracts between farmers and ACS. Syngenta was to provide technical support, through the provision of field staff and the establishment of Learning Centres to promote and support use of the package, and supplying hybrid maize varieties, pesticides and herbicides. The role of ACS

was to provide credit to facilitate access to inputs, and to purchase maize and pulses at the end of the season, guaranteeing the credit payment.

4. Revealing the Innovation process

In late 2015, shortly after the partnership was formalised, ACS was sold. The new owner was not prepared to take on the financial risk of lending to farmers—ACS had struggled to recover loans from farmers during their past work with Syngenta, and while the previous owner was comfortable with this loss, the new owner gradually withdrew from the partnership, and eventually agriculture altogether.

This left the partnership in a precarious position—though Syngenta and UNRAM wanted to continue the partnership, without an affordable credit source for farmers there was no way they could purchase Syngenta seeds, and new buyers for maize and pulse harvests had to be found. ARISA provided loans to a small number of farmers to ensure some work could be done in the first season (2015/2016). An El Nino wet season caused some crops to fail in East Lombok due lack of rainfall. For those farmers who were able to harvest, UNRAM worked to find alternative buyers, and in general, the focus in the project for UNRAM shifted from trials of crop practices to facilitating and building relationships in an effort to link farmers to sources of credit and traders who would pay a fair price.

SAFIRA¹² was brought in by ARISA to help identify alternative options for sourcing credit and develop relationships between UNRAM, Syngenta and the banks. Bank NTB was brought into the partnership, providing *Kredit Usaha Rakyat* (KUR) loans under a government program to provide affordable credit to micro, small, and medium size enterprises. The Government provides funding to banks to provide loans at a capped interest rate, and also provides partial credit guarantees through state-owned credit guarantee companies. For many farmers, this has been their first opportunity to access loans through the formal banking system.

Throughout this process, UNRAM's role has become more focused on brokering, facilitating and trust building, in addition to traditional research roles: engaging with *district governments* to ensure fertiliser availability, promote the project technical package, and secure support to fix broken pumps for irrigation; engaging with *farmers* to support use of improved varieties, complete loan applications, build trust between farmers and the bank, and farmers and Syngenta, and to ensure loan repayments are made on time; and facilitating negotiations between farmers and *traders* to agree on price for different grades of maize.

The 2016/2017 wet season was again affected by an El Nino weather event, meaning many farmers faced dry conditions, especially in North Lombok. Despite the dry conditions, almost all farmers were able to repay their loans, despite the lower yield. Bank NTB, UNRAM, and Syngenta were largely satisfied with the business model, and have been discussing strategies to improve the process for the next season. For example, to iron-out processing issues to make sure loans are provided in time for farmers to access fertiliser through government (subsidised) distribution programs.

Government intervention on maize has continued to deliver high prices, creating good economic conditions to support the ongoing partnership. In 2016, the government introduced a national standard base price for maize, and in 2017 announced restrictions on imports of maize. These measures have driven up local prices and encouraged farmers to plant more maize, providing incentive for Syngenta to expand or increase its focus on maize in NTB.

The partnership activities have grown beyond what was originally intended. Syngenta established a third learning centre in North Lombok, with the support of UNRAM and loans through Bank NTB. Since the positive results of the 2017 season, Syngenta have approached UNRAM to provide technical assistance as part of an existing Mercy Corp and Bank Andara project in Sumbawa. Bank NTB has indicated they are willing to expand the loan scheme to new areas, contingent on UNRAM providing technical support and brokering farmer relationships. A number of other businesses, including a seed production company, agrochemical company

¹² Strengthening Agricultural Finance in Rural Areas: Part of the AIP-Rural partnership, SAFIRA aims to expand smallholder farmers' access to finance.

and Bank BRI have also entered into discussions with UNRAM, interested to join the intervention and implement a similar business model. As the system and processes become more established, other institutional changes are being considered, such as mechanisms to access crop insurance, supporting farmers to become certified mungbean and groundnut seed producers, and engaging farmer-group leaders as Syngenta agents to facilitate sustainability post-project.

Other AIP-Rural projects SAFIRA and PRISMA have both expressed an interest in supporting further expansion of the work.

5. Impacts

At the *household* level, participation in the intervention and adoption of recommended practices has contributed to an increase in productivity and net income gains compared to control groups. For many households, it has also provided access to credit for the first time. Significantly, thirty per cent of these loans have been provided directly to female farmers, who play an active role in household finances and maize farming, but are often unable to take loans for cultural reasons. This has provided households with a credit history that will help in future loan applications.

For *UNRAM*, the partnership experience provided through ARISA has expanded their skills and confidence in dealing with the private sector, and established their role as a broker and facilitator to support innovation in maize farming. It has helped UNRAM to improve their relationship and reputation with Syngenta, Bank NTB and other companies—with partners indicating any expansion of activities requires UNRAM's involvement. Partnering with Syngenta and Bank NTB has also allowed UNRAM to increase their on-ground work and subsequent community impact.

UNRAM have built close relationships, and are highly regarded and trusted at the community level, and with district governments. The partnership with UNRAM has helped increased the legitimacy and trust-worthiness of Syngenta with community and government, contributing to increased sales, both by increasing sales to farmers participating and through a decision by the district government in North Lombok to use Syngenta seeds as part of their seed distribution program in the 2017/18 wet season. Additionally, the partnership with Bank NTB makes credit available to farmers so they can afford to buy Syngenta inputs. The decision by the North Lombok government to use Syngenta seeds for their program is positive for Syngenta, but may have implications on seed availability (of variety NK212) for those farmers who want to purchase it. The alternative promoted by Syngenta has higher yields but is less drought tolerant.

From *Bank NTB's* perspective, the partnerships help them to distribute loans under the KUR program, which is a government priority, and in turn helps to build their customer base.

6. Key insights and implications

This case highlights the dynamic and unpredictable nature of public-private sector partnerships. The withdrawal of ACS as a credit provider initially threatened the viability of the whole intervention, but arguably has resulted in a more robust partnership with Bank NTB. Identifying and establishing a new partnership with finance providers and traders took time. It would not have been possible without a grant scheme like ARISA, that was able to support the UNRAM-Syngenta partnership with loans in the first season (to maintain trust and interest of farmers), and support them to identify alternative financing options, rather than simply withdrawing funding and abandoning the project as a failure. In other words ARISA was able to incubate the partnership through some initial challenges to a point where the issues of establishing new partners are ironed out to an extent where the partnerships are stable, the business model is proven to work, and is attracting further interest from other businesses.

The senior researcher and project leader in UNRAM has been a central figure in championing the ongoing success of the project. Both the individual team members, and UNRAM as an institution have significant social capital that has sustained the partnership through the ups- and downs of the partnership process. The scope and expectations of the project have expanded dramatically since the first expression of interest, and the project leader's willingness to adjust and expand with this is a key feature of why the partnerships have succeeded to the extent that they have. 'Community service' is one of the three principles for regional

universities, and the brokering role played by the project leader has been crucial to enabling benefits in production and income for farmers. However, there is limited recognition of the brokering and facilitation role played by the project leader within UNRAM.

The current plans for expansion to new areas of Lombok and Sumbawa are positive indications of the value of the partnership to those involved. However, despite the value of UNRAM's involvement, both in a technical capacity and as a broker and facilitator of a range of relationships, this involvement is not yet financially supported by the private sector. ARISA will provide additional budget to support UNRAM's involvement in the Sumbawa site, while the district government of North Lombok is providing staff and additional funding. It is not clear if Syngenta would be willing to pay for this in the future if ARISA support was not available. For the universities involved in ARISA, the aim is eventually to have the private sector funding their involvement. It may be that this kind of relationship takes longer to develop, or perhaps just as importantly, that partnerships remain a strategy for all partners to gain access to additional funding sources (eg. international aid funding) that would not be open to any individual partner alone.

In the literature, one of the key benefits of working in partnerships is sharing risks, or alternatively, partners taking on the risk that they are best able to carry. This case highlights some imbalance in how risks are shared, with most risks primarily held by UNRAM, or government. Researchers in the UNRAM team have spent years building up relationships of trust with farmers and village authorities—this is a key advantage for Syngenta and one of the benefits they see in the partnership. UNRAM risked its reputation with the community by bringing in Syngenta (some farmers in the villages voiced some mistrust after past bad experiences) and ACS (who made a range of commitments that they never followed through). UNRAM has been the key party facilitating community relationships and had the partnership not recovered after ACS' withdrawal, the risks to their reputation would have been high.

The case also demonstrates the influence of government policy in the success of the interventions. The current favourable policies on maize pricing encourage farmers to grow maize, in contrast to other ARISA interventions where policies are depressing commodity prices and discouraging farmers from investing in improving production (for example, in beef and cassava). Likewise, bank involvement has been supported through government subsidies of KUR loan products.

The government subsidy to banks administering KUR loans caps the interest rate and also covers loan guarantee fees. That is, the financial risk to Bank NTB is partially covered by the government. Mitigation of this risk sits, to a significant extent, with the UNRAM team, who work with farmers to ensure loans are repaid. SAFIRA is working with Bank NTB to explore alternative commercial loan products that may be suitable, however it remains to be seen if these alternatives will still be accessible (ie. affordable) to farming households, or who would take UNRAM's role in ensuring loan repayments.

The incentives and capacity for different partners to be involved in a collaboration such as this, are of course diverse. It is worth reflecting on the specific role and incentives of Syngenta, who have leveraged the partnership to expand sales to farmers, but perhaps more importantly, to position itself with local government as a key provider of seeds for government programs. As a large multinational, Syngenta has corporate drivers and programs that support the company to invest in the growth of inclusive, sustainable markets which other companies either may not have, or may not have the resources to support initially.

7. Conclusions and questions

The case study highlights the following points:

- Innovation processes are unfold over time in unpredictable ways due to different actors involved, as well as external drivers (weather, markets). Current supportive price policies for maize have encouraged farmers to grow maize and supported the partnership.
- There is a role for grants programs, like ARISA, to provide some stability and security of funding and facilitation support while partnerships become established that support them to weather the initial uncertainties.

- Research-private sector partnerships are sometimes portrayed as bilateral agreements, this is certainly not the case here, with several additional actors outside the formal partnership (eg. local leaders, traders, government) making significant contributions to the success of the partnerships.
- Partners bear different degrees of risk, especially in the establishment phases of a partnership. In this case, the partnership has succeeded due to the significant social capital and trust between UNRAM and others. As a result, UNRAM shouldered more of the reputational risk in the establishment of the partnership. The role of social capital in bridging times of flux and uncertainty is under-acknowledged in the literature on research-private sector partnerships.
- The project leader in UNRAM has been a key champion for this partnership and is central to its success. The role of the project leader and his team have changed significantly from traditional research roles to brokering, facilitation and networking. These roles tend not to be recognised in university reward systems. It may also not be the best use of their expertise and may indicate missing actors in the innovation landscape.
- Partners have different incentives for being involved, and it is important to understand and align these incentives. (eg. UNRAM supporting Syngenta's bid for the government seed contract).
- Compared to the majority of the Indonesian business landscape, which is dominated by micro- and small to medium enterprises, Syngenta is well positioned to contribute to this kind of partnership.

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