Applied Research and Innovation Systems in Agriculture (ARISA)

Semester Report No. 3, August 2016

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 small, medium and large agribusinesses to adapt existing innovations for agriculture in eastern Indonesia. The project will co-finance 7-8 agribusiness-RI collaborations to test the proposition that more market-facing engagement and outreach mechanisms can generate deeper, more sustainable benefits to users of innovations (in this case, smallholder farmers and their market partners).

2. ADEQUACY OF PROGRESS IN THE LAST SEMESTER

a) **The overall progress in operations in the first Semester of 2016 was satisfactory.** Most aspects of the project have been progressing satisfactorily. Three interventions are now well established and another three have commenced and are ramping up their activities. Two new staff (Intervention Manager and Finance/Administrative Officer) commenced on June 1st and a Monitoring and Evaluation (M&E) Manager will commence on September 1st 2016. A short-term M&E consultant has been assisting May-August 2016.

   A new MoU and Implementing Agreement (IA) is in the final stages of negotiation with RISTEKDIKTI in response to BPPT reaching a view that ARISA did not align well enough with the operations of their agency. A good relationship has been developed with RISTEKDIKTI and there are good opportunities to collaborate in the broader ARISA goals in innovation. However, the change in partner and the subsequent negotiation process has meant a delay in holding a PCC meeting.

b) **Implementation of interventions.** Six interventions are in place and a seventh intervention is in early stages of development with RISTEKDIKTI. With the recruitment of Teddy Kristedi as Intervention Manager, we are using his experiences and connections to explore additional, emergent interventions, with a focus in NTT as it has been difficult to develop an intervention that has a strong value proposition and involves both the private sector and a research institute. Based on SRP input, instead of a full scale 8th intervention, additional resources are being directed to existing interventions to ramp up their scale and impact.

   Weather conditions over the last growing season were not ideal due to the strong El Nino event. Despite this the maize intervention produced encouraging results, with Syngenta wishing to ramp up their involvement in maize in Lombok. ARISA is working closely with SAFIRA to strengthen the input credit aspects of the intervention, which current constrain wider uptake of the technology. Mitigation strategies (irrigation of leucaena seedlings) were put in place in the beef intervention to manage the impacts of a dry start to the rainy season. As well as changes made to the maize intervention, there have been reviews of the beef and cassava interventions with a strengthening of the market linkages in beef and expanding the scope of the cassava intervention.

c) **DCED implementation.** Work on Results Chains, indicators, women's empowerment, and baseline methodologies has progressed well over the last six months. The approaches have been evolving and in November a DCED consultant undertook a document review to assist ARISA with its implementation of DCED. This will continue to be a process of continuous improvement. Work is now commencing on baseline data collection. A considerable challenge is ensuring there are appropriate resources to match the needs and to assist with this balancing of resources and effort required, we are looking to appoint an additional person in the Surabaya office. In parallel, we have been "right-sizing" our approach to DCED, including simplifying Results Chains, indicators and business models.

Results from evaluation of the interventions show that adoption and access is ramping up with over 2,500 households accessing information on interventions and around 700 now adopting new practices in the interventions. Outreach numbers are still low (<100) because in most of the interventions this is the first season and crops have not yet been harvested (cassava, sugarcane) or it is too early to measure impact in animals (beef, dairy).

d) **Strategic Review Panel.** The Strategic Review Panel in March 2016 received an update from the Team Leader on progress over the previous six months. Key recommendations from the SRP included:
(i) ensuring the MRM functions are proportionate and fit for purpose and that indicators could be harmonized efficiently into the AIP-Rural Management Information System.
(ii) following up on Tim Stewart's (Palladium Consultant) recommendation for stronger private sector engagement and market development resources in ARISA and critically reviewing interventions by a market development specialist to ensure the business cases are sound.
(iii) outreach targets are appropriate and ARISA needs to manage and develop the portfolio of interventions to deliver impact targets

Good progress has been achieved on these recommendations. Lauren Xie, the Results and Engagement Manager, has been working effectively with the AIP-Rural Secretariat to ensure aggregation of indicators is well aligned with the AIP-Rural MIS. Discussions were held with Tim Stewart on each of the six interventions to gain his insights and recommendations on improving business cases, especially for the three interventions established in September/October 2015. As a result of these discussions and input from the Secretariat, established interventions have been modified. An Intervention Manager, with strong private sector experience, has been recruited to further strengthen the existing interventions and to explore opportunities for new "fast-start" interventions. Projected impact targets have been revised based on intervention reviews and these are on track to deliver proposed impacts.

3. BUDGET

Expenditure on project management (Australia and in-country) is in line with the budget for this semester (Table 1). The operational budget is somewhat underspent but with interventions now being implemented it is starting to ramp up and is expected to be closer to planned by the end of the 2015-16 financial year. The delays in procuring a local HR company has also delayed expenditure on local staff but the HR contract has now been agreed and executed.

Table 1. January to June 2016 and whole of financial year (2015-12016) expenditure.

	Jan 1 –June 30 2016	2015-16 Financial Year
CSIRO Project Labour	$202,544	$357,874
CSIRO In-Kind (Project support and overheads)	$214,766	$378,750
Travel and Operating (includes in-country labour costs and interventions)	591,271	$1,141,792
Total	$1,008,580	$1,878,416
Balance carried forward into 2016-17		$1,004,039

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.

The consultancy firm McKinsey 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).

2. PROJECT MANAGEMENT AND PROGRESS

(a) Project Personnel

There have been significant developments over the last six months. We were finally able to sort out the recruitment arrangements with KPSG and meet the various requirements for DEPNAKER approval. We have recruited an Intervention Manager (Teddy Kristedi) and a Finance/Administrative Officer (Suli Hakim). Teddy and Suli commenced with ARISA on June 1st. We have appointed a Monitoring and Evaluation (M&E) Manager (Yustika Muharastri) and she will commence at the end of August.

Both appointments are having a positive impact on ARISA. Teddy Kristedi has very good private sector networks as a result of his agricultural value chain work over a number of years. He is bringing these networks and a rapid understanding of what is needed in ARISA to develop ideas for strengthening some of the interventions, in particular improving private sector involvement and engagement. We expect to see the impact of Teddy's involvement in the beef, maize, dairy and cassava interventions in the coming months. The arrival of Suli Hakim has meant that some of the day to day administration (acquittals, travel arrangements etc) can be offloaded from Rob Caudwell and Lauren Xie.

Lauren Xie will be leaving Indonesia on a full time basis from later this year (after the Mid-Term Review). In the 18 months Lauren has been with ARISA she has made a great contribution and has been expanding her inputs beyond DCED and monitoring and evaluation into aspects of innovation systems. We have been able to retain Lauren until at least the middle of 2017 and for the first six months of next year she will be based in Brisbane, travelling fairly regularly to Surabaya. Given this change we opted for a person in the MEL manager role, who can hopefully take over the day to day activities associated with DCED once Lauren departs. If necessary, we will provide further M&E capacity in Surabaya.

(b) Project governance

The Team Leader (Andrew Ash) visits Indonesia on a four week to six week cycle to oversee project implementation but just as importantly to establish a good working relationship with the DFAT Senior Advisers, DFAT management in Jakarta and the PRISMA team. In between visits the Team Leader and Jim Tomecko have regular email exchanges and skype discussions when required.

The major governance challenge for ARISA has been the decision by BPPT, under a new leadership group, to withdraw its operational sponsorship of ARISA. BPPT is an implementing agency and the new leadership

team believes the ARISA project doesn't align with their core mandate. BPPT have assisted ARISA in connecting with the Ministry of Research, Technology and Higher Education (RISTEKDIKTI). Archie Slamet (CSIRO Country Manager) has taken the lead on these negotiations and we have developed a positive relationship with RISTEKDIKTI that has moved forward to the development of a MoU and an Implementing Agreement (IA). The Director-General of Innovation Enhancement (Dr Jumain Appe) has been strongly supportive of a collaboration with CSIRO. He has a view that the innovation systems work being undertaken in ARISA has great relevance to their innovation agenda and he is keen to use the developing RISTEKDIKTI-CSIRO collaboration to enhance the Ministry's pathway forward on innovation. It is hoped that a MoU and IA can be finalised in August 2016 with a PCC meeting to be held soon after. Associated with the partnership with RISTEKDIKTI, CSIRO will place a liaison officer in RISTEKDIKTI to facilitate the partnership.

(c) Strategic Review Panel

The Strategic Review Panel met in March 2016 and the Team Leader was able to spend an afternoon with the SRP to update them on progress, challenges and opportunities. Key recommendations arising from the SRP were:

(i) The monitoring and results measurement outputs from ARISA are good practice and the SRP endorses recent management decisions about resourcing MRM functions and ensuring that they are proportionate and fit for purpose. The system being developed should be harmonised with the PRISMA MIS to enable whole-of-portfolio reporting – using consistent indicators, language and methods where there is overlap.

Lauren Xie has been working closely with the Secretariat to ensure consistency in approaches in the MIS and the ability for ARISA indicators to be aggregated easily into a whole of AIP-Rural reporting system.

(ii) The recent inputs from Tim Stewart (Palladium Consultant contracted to provide advice on the interventions), and evidence from several interventions and concepts, highlight the need for stronger private sector engagement and market development resources in ARISA. A CSIRO management response to Tim Stewart's report should be negotiated with the Secretariat and implemented as agreed. This should include a review of the staff competencies needed and a critical review of the current and proposed portfolio of interventions by a market development specialist to ensure the business cases are sound.

Discussions were held with Tim Stewart in early May on each of the six interventions to gain his insights and recommendations on improving business cases, especially for the three interventions established in September/October 2015. As a result of these discussions and input from the Secretariat, established interventions have been modified. The newly recruited Intervention Manager, Teddy Kristedi, has strong private sector experience and is already developing options and plans to further strengthen the existing interventions and to explore opportunities for new "fast-start" interventions. Responses to the Secretariat's recommended actions are described in Appendix 1.

(iii) The quantitative and qualitative targets designed for ARISA remain appropriate and achievable. CSIRO should manage and develop the portfolio of interventions to deliver these targets by applying appropriate private sector engagement and market development approaches complemented by the innovation focus. This will entail prioritisation of the interventions most likely to achieve scale and sustainability.

In response to this recommendation, additional effort has been devoted to seeing how the most prospective of existing interventions, in terms of impact by December 2018, can be further developed with some additional input and resources. It was decided that this had the greatest chance of achieving outreach targets rather than devoting effort to new interventions (apart from a possible new intervention with RISTEKDIKTI). The focus has been on the cassava intervention and the IPM intervention. Revised projection numbers suggest that the outreach target of 10,000 will be achieved by the first half of 2019.

3. INTERVENTION PROJECTS

As of 2016 Semester 1, 5 contracts have been signed between ARISA and RIs. 6 ISDs are finalized and a total of 5 Partnership agreements have co-drafted by ARISA and partners. Two partnership agreements have been signed between PS and RI partners. Discussions are continuing on further interventions. Progress and challenges on the individual interventions are outlined below.

Beef

This intervention involves developing a profitable and sustainable beef production system in Sumbawa NTB, through improved engagement of cattle farmers with a traders association (PEPEHANI), individual traders, and a beef processing company (PT Dharma Raya Hutamajaya). The research institute partner is the University of Mataram (UNRAM). The intervention will improve the incomes of approximately 1,000 cattle farmers in West Sumbawa and Sumbawa Districts. This is being achieved by: improving cattle nutrition and feed management; reducing calf mortality and increasing calving rates; developing a premium price for high quality, traceable cattle; and providing improved access to markets and pricing transparency.

The main achievements of the intervention to date include: approximately 300 farming households from 19 farmer groups have access to and have started using the new technology for cattle rearing, which is above target for year one; more than 200,000 Leucaena seedlings have been produced and planted; and a range of capacity building activities have been implemented for farmers on planting Leucaena, cattle management and improved cattle handling. Two women's farmer group discussions have been completed, for Balinese and Sumbawese women. Material on gender equity has been developed and training will be done with farmer groups in September, focused on the benefits of women's engagement in the intervention, especially for improved farm productivity and income.

The main challenge for the intervention is that the enabling environment is affecting beef price and making it very difficult for PT Dharma to buy cattle from farmers in Sumbawa. Essentially a change in government policy has resulted in cheap frozen beef imports arriving from India. The meat quality is inferior to Sumbawa Bali beef, but the price is much less than what PT Dharma can sell their range of differentiated cuts. As a consequence of this, the immediate prospects for PT Dharma to purchase cattle from farmers in Sumbawa is limited, although beef markets are dynamic and this situation could change quickly. However, this is not an issue for the farmers as they are still receiving high returns by selling cattle to traders.

In response to these changing market conditions, ARISA has been successful in getting the traders association (PEPEHANI) and some individual large traders to formally join the intervention as partners. These large traders will work with UNRAM to stimulate the production of fattened cattle on Leucaena, as it benefits both traders and farmers. UNRAM will provide training to the traders on beef fattening systems. The traders will work with farmers to extend the Leucaena beef fattening system, and introduce transparency to the cattle transaction process for farmers who are fattening with Leucaena. This will be done by providing sales based on live-weights rather than estimated weights. In addition to this, there is a short-term opportunity for farmers and traders to assist with propagation of Leucaena. Traders, who want to increase their business, will provide seedlings to farmers at zero cost to build relationship and market share of beef sales. One large trader has already agreed to growing Leucaena seedlings to use this for market leverage. A small number of farmers with mature trees of the improved variety of Leucaena (Taramba) being promoted in this intervention have been able to create new businesses and generate additional income through sale of seed.

Maize & pulses

This intervention involves using best practices for dual cropping models using new hybrid maize with pulses (mung bean and ground nut) on drylands in NTB. The partners are PT Syngenta Indonesia, PT Asia Crop Solutions (ACS), and the UNRAM. The intervention will improve the incomes of about 1,100 smallholder

farmers in East and North Lombok. This is being achieved by the use of: dual cropping, maize-pulse cropping techniques; hybrid maize seed suitable for East and North Lombok growing conditions; improved fertiliser management; improved post-harvest processing techniques; and providing improved access to markets for farmers.

The main achievements of the intervention to date include:

- 50 farmers have used the new technology (20 in North Lombok and 30 in East Lombok). The new maize farming system is quite different to the traditional system, so it was planned to only reach modest numbers in the first year, given the relatively high level of inputs required.
- Despite it being a poor start to the rainy season due to El Nino, the maize crops did relatively well in the north with yields of around 7 t/ha with 80% of high quality (Grade 1). In East Lombok there were some crop failures, but those who managed the crops and planted at the right time to avoid the worst period of the dry spell achieved high yields (8 t/ha). All maize was quickly purchased by traders.
- A range of applied research into the new maize-pulses cropping system has been successfully conducted at the Syngenta Learning Centre in North Lombok. This has involved collaboration between Syngenta and UNRAM, with technical assistance from a CSIRO specialist. The Syngenta Learning Centre has been used to training farmers and expose them to the new cropping system.

The main challenge for the intervention is that ACS, who originally agreed to provide credit input and purchase the maize, changed ownership in late 2015. The new owner decided to divest interests in agriculture in NTB and they have withdrawn from the partnership. So finance has become the main issue without ACS in the partnership. Syngenta are still committed to the intervention and will continue to provide field staff and Learning Centres in East and North Lombok. Based on the results from the ARISA intervention in 2015-16, Syngenta has expressed increased interested in upscaling the marketing of their hybrid seed in Lombok. Many areas of Lombok are irrigated or have the potential to use irrigation, so Syngenta see this as potentially offering a year round market for their hybrid maize seeds.

ARISA is working with SAFIRA to address the issue of finance for this interventions. Meetings have been held with four inputs suppliers/traders in Lombok, as well as four local banks and credit unions. From these initial meetings it is apparent that there are significant opportunities to work with BRI or Bank NTB for finance, possibly using the “KUR” loan product, which is a government priority. Traders will also be engaged to purchase the harvested maize, and links to local input suppliers will be needed, as Syngenta do not have direct marketing channels in these areas. It is expected that a new system for agricultural finance will be ready for implementation during the next growing season.

<u>Cassava</u>

This intervention involves developing integrated cassava production, in-village processing into modified cassava flour (MOCAF) chips, and utilisation of by-products to improve the welfare of smallholder farmers in the southern part of East Java. The partners on the cassava production and processing are PT Bangkit Cassava Mandiri (PT BCM), University of Jember (UNEJ), a range of cassava processing cluster owners, farmers’ cooperatives and groups. PKPU and Rumah Zakat Infaq dan Shodaqoh are the partners who will buy the sheep. This intervention will improve the incomes of approximately 2,800 cassava and sheep farmers. This is being achieved by: improving the production and productivity of cassava; organising clusters and mechanisation for improved cassava chips processing; using an integrated farming system, using waste products from the cassava processing to produce sheep feed and organic fertiliser; improving sheep feeding and management;and developing market access for both cassava and sheep products.

The main achievements of the intervention to date include a strong commitment from the cluster owners, the UNEJ and PT BCM, who provide technical and financial assistance (low interest loans) to cluster owners, transport to the MOCAF to their mill in Solo, along with a guaranteed market linkage and price premium for MOCAF. Approximately 280 cassava farmers have started to grow cassava over the last few months with many more interested. An integrated MOCAF cluster processing and feed facility has been constructed,

which will be used for testing the use of cassava waste for sheep feed. Composting facilities have also been constructed to provide fertiliser input for new cassava plantings. Technical assistance in plant nutrition for cassava production has been provided by a CSIRO specialist.

This intervention has made a good start, with strong private sector engagement and market development approaches, complemented by an innovation focus and an important complementary role for co-operatives. This intervention shows significant potential to achieve impact at scale, and it is was therefore decided to increase the level of investment from all partners, to further increase the scalability. There are no major changes to the overall design, with the increased scale coming from a focus on the core activities of cassava production and MOCAF processing, along with sheep production using cassava by-products for feed.

The main challenge for the intervention is to more effectively communicate the role of the lead company, PT BCM, to a range of stakeholders. In particular, the ARISA team is investigating the potential for a greater role for the company, in providing more upstream technical and financial assistance to cassava farmers and clusters. In addition to this, the commercial role of the local and parent cooperatives needs to be better understood and communicated.

Through this intervention approximately 230 new jobs have been created in the new clusters, the retail outlets which sell MOCAF products and the coops. The majority of these jobs have been filled by women as they are part-time and flexible.

Sugar

This intervention involves improving market linkages, the commercialisation of agricultural innovations, and an enabling policy environment for sugarcane development in Madura, East Java. The partners are PT Perkebunan Nusantara X (PTPN X) and the Indonesian Sugar Research Institute (called P3Gi), along with Trunojoyo University. This intervention will improve the incomes of approximately 500 farmers. This is being achieved by: improving sugarcane farming techniques, increasing productivity and quality; developing mechanisms for effective dissemination and commercialisation of these new technologies; testing the viability of deep tube wells to profitably produce sugarcane; improving harvesting and milling efficiency; and providing access to markets and ensuring premium returns to farmers, though improved sugar extraction and price incentives.

This intervention has a strong private sector focus, with implementation led by PTPN X, working with P3GI which is a privatised research institute. It commenced in the first quarter of 2016, with a range of start-up activities, including baseline studies, the establishment of demonstration sites for rain fed and irrigated sugar cane, and technical assistance in dryland sugarcane farming systems from a CSIRO specialist.

The sugar company has plans to build a new sugar mill in Pamekasan, Madura. Therefore, if this intervention can promote increased interest and supply of sugarcane, then it will have significant commercial implications for the sugar company and other market actors. Furthermore, sugarcane in Madura provides an ideal opportunity for the feasibility of land grouping and mechanization to be tested. This will be done as part of the intervention. The lessons learned from this will be relevant to other agricultural enterprises in other locations in eastern Indonesia.

The most significant challenge facing the project is the ability of the company to convince farmers to convert from existing crops to sugarcane. They are offering premiums and transport subsidies to facilitate this change. Scaling will be successful with increased mechanisation, which introduces some land tenure issues because farm boundaries are demarcated with bunds, which constrains mechanised harvesting.

Dairy

This intervention involves developing fodder farming business models for smallholder dairy production in East Java and improving animal husbandry and feeding practices of dairy farmers. The partners are PT

Nestle and the University of Brawijaya. It will improve the incomes of approximately 1,000 dairy and fodder farmers. This is being achieved by: increasing the supply of high quality fodder throughout the year; improving dairy cows' nutrition and feed management; improving dairy cow and calf management; and providing access to appropriate technologies for safe milk production for domestic markets.

This intervention has a strong private sector focus; the implementation is led by PT Nestle, with Brawijaya University (UNBRAW) working on the testing and development of the fodder. The fodder nursery will be commercialised as soon as possible during the intervention. By necessity, it has been started up by UNBRAW) working with farmer groups, but a commercial partner will be sought at an early stage. There are many small companies that have horticultural nurseries in these areas, so it is expected that one or more of these will be interested in investing in a fodder nursery. Fodder traders have been identified and it is possible that some of these will be involved in the intervention. The intervention will determine the economic benefits of growing fodder relative to other agricultural enterprises. This is already underway, through the involvement of a CSIRO specialist in agricultural economics.

This intervention only commenced in April 2016. Since then PT Nestle have started work on the promotion of a range of best practices in animal husbandry, involving approximately 315 farmers. UNBRAW has started work on the testing and commercialisation of different types of fodder.

Shallots - IPM

This intervention involves the using integrated pest management for shallot production in East Java. It is a joint ARISA-PRISMA intervention. The main collaborators are PT NuFarm, PT Nasa, PT Solbi, University of Gadja Mada, and the Plant Protection Agency. It will improve the incomes of at least 3,000 shallot farmers through the adoption of IPM.

This intervention follows on from a pilot study which was implemented between August 2015 and May 2016 to test an IPM system for dry and wet season shallot production in East Java. The pilot study showed that:

- It is possible to grow shallots profitably with a much reduced use of chemical pesticides, using biological control agents and cultural practices to control pests and diseases.
- The IPM approach can increase farmers' income by up to 50%, mostly from reductions in costs related to pesticide use (Appendix 2 shows the economic assessment for the wet season pilot which involved both pest and disease management).
- There are significant environmental benefits resulting from the use of IPM for shallot production.
- It is possible to extend the field life of existing crop protection products by using IPM, due to the reduced resistance pressure in the target pest populations.
- There is a large potential market for companies to sell existing and new crop protection products to shallot farmers for use as part of the IPM system.

These benefits will be scaled out through the full intervention, which commenced in May 2016. Demonstration sites have been started up in three geographical locations in East Java. The baseline study will be done in July. Technical assistance in IPM development and adoption has been provided by a specialist from IPM Technologies, Australia. There are on-going discussions with the intervention partners, to clarify their roles in the intervention, as well as to generate further interest and co-investment from the private sector partners.

Pipeline interventions

ARISA is looking at new interventions from two sources:

1. *With RISTEKDIKTI, who is CSIRO's new counterpart from the Indonesian Government in the management of the ARISA project*: Discussions about new interventions are at a very early stage because RISTEKDIKTI and CSIRO are still in the process of formalising their partnership for the ARISA

project. It is expected that more detailed investigations into new interventions will start in July or August.

2. *With PRISMA, especially for joint interventions in NTT Province*: Ideally these will be existing PRISMA interventions in which the private sector partner has identified innovations that need further testing and development, and have expressed an interest in partnering with a research institute in eastern Indonesia. Potential sectors include pig production and coffee. This will be investigated further by the ARISA Intervention Manager between July and September.

To achieve reasonable outreach by the end of 2018, new interventions will need to be targeted to sectors and innovations where impact can be achieved fairly rapidly e.g. short-cycle crops.

In addition to these opportunities, ARISA is always open to proposals related to applied research and innovation systems from other projects within AIP, as well as from a broad range of stakeholders in eastern Indonesia, especially from the private sector.

4. DCED, MONITORING AND EVALUATION

The Monitoring, Evaluation and Learning (MEL) system has been revised to better fit the size of the ARISA project and Indonesian context, as well as to draw in much of the responsibility into the ARISA team, away from the RIs. Currently this system is partially operational. In order to fully operationalize the revised MEL system, a new MEL Manager is needed, who will join ARISA in August. Key features of the new system include increased ARISA ownership over the design and analysis of M&E activities, and a flexible approach to collaborating with the various RIs. For example, some RIs will want to be more involved, as they wish to produce publications from the MEL studies, while other RIs would prefer to reduce their time spent on MEL. Taking a tailored approach to each project partner allows ARISA to more effectively allocation its resources across the interventions.

Data has been collected on all required DFAT indicators in accordance with the AIP-Rural Protocol for Reporting on DFAT Indicators, version 3.4, as requested for the upcoming MTR. The latest values for key indicators associated with ARISA KPIs, aggregate indicators, and AIP-Rural relevant indicators are shown in Tables 2, 3 and 4. ARISA also has key indicators relating to Innovation and these are shown in Appendix 3.

Results from the evaluation of the interventions show that adoption and access is ramping up with over 2,900 households accessing information on interventions and around 800 now adopting new practices in the interventions. Outreach numbers are still low (<100) because in most of the interventions this is the first season and crops have not yet been harvested (cassava, sugarcane) or it is too early to measure impact.

The projected and trajectory outreach numbers are shown in Figure 1. At this stage ARISA is still largely on track. Through the second half of 2016 it is expected that adoption numbers will ramp up significantly and attribution of income to this adoption will follow.

A DCED auditor and consultant is currently conducting a document scan/pre-audit for 1-2 full interventions, gender, the aggregation system, PRIP, program costs, and the latest Results Measurement and Learning (RML) Manual. Recommendations will be implemented prior to the DCED audit in May 2016.

Lastly, a project-level results chain has been developed for ARISA to capture the project's overall change logic, depicting the relationship between ARISA's outreach targets and its larger innovation systems change agenda Appendix 4). The two main elements of ARISA's innovation systems change agenda are (1) improving the capacity of specific RIs to partner more effectively with the private sector and (2) developing a mechanism for connecting lessons from the interventions with policymaking at the national level. Two of the five ARISA KPIs measure progress toward these institutional impacts, while the other three measure progress toward the 10,000 farmer household outreach target.

Table 2. ARISA KPIs as of July 31st, 2016.

ARISA KPIs				
ID	**Indicator**	**Value (Cumulative, as of Y16S1)**	**Date**	**Remarks**
KPI 1a	Changes in "innovation capacity" of research institute intervention teams	4	Jun-16	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 ISRI, where the mandate of the institution has been to serve industry. 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 UNJEM, who had deeper/more mature partnerships at the commencement of ARISA, the degree of change is less visible.
KPI 1b	Changes in "innovation capacity" of targeted research institute faculties	2	Jun-16	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. 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 institutes.
KPI 2	Progress toward establishing policy dialogue mechanism to engage in learning from innovation at the RI-PS interface	See Remarks	Jun-16	Activities completed to date include: (1) Documentation of the innovation landscape via consultation with CIPG and their report, (2) Consultation with key actors, including DFAT's Knowledge Sector Initiative, RISTEKDIKTI and the Indonesian Academy of Sciences, (3) definition of a suite of options for how ARISA could usefully proceed in this space, with various resource implications. The team is currently seeking feedback on these options from the team and broader stakeholders. Once agreement on the preferred pathway(s) has been established, the team will need to undertake a more detailed design of next steps, actions and responsibilities, including timeframes.
KPI 3	Net additional and attributable income changes of farmer HH using project-supported innovations (impact)	Rp.1,673,907,640	Aug-16	
KPI 4	Number of farming households who have adopted the project innovation (use)	801	Jul-16	
KPI 5	Number of farming households who have been exposed to the project innovation (access)	2,918	Jul-16	

Table 3. ARISA's Aggregate Indicators.

Aggregatable Indicators				
ID	**Indicator**	**Value (Cumulative, as of Y16S1)**	**Date**	**Remarks**
	Farmer access -number of farm households accessing innovation	2,918	Jul-16	Same as ARISA KPI 5
	Farmer use - number of farm households using innovation	801	Jul-16	Same as ARISA KPI 4
	Number of farm households with improved access to finance	74	Jul-16	
	Projected outreach	112	Jul-16	
	Actual outreach (same as AIP-Rural KPI 1)	93	Aug-16	
	Value of additional agricultural production in IDR	Rp. 1,459,178,507	Aug-16	

Table 4. ARISA contribution to AIP-Rural KPIs.

AIP-Rural KPIs				
ID	**Indicator**	**Value (Cumulative, as of Y16S1)**	**Date**	**Remarks**
KPI 1	Number of farm households with increased net incomes (same as actual outreach)	93	Aug-16	
KPI 1a	Number of farm households under $2.00PPP poverty line with increased net-incomes	0	Aug-16	
KPI 2	Net attributable incomes increase of all farm households in IDR	Rp.1,673,907,640	Aug-16	same as ARISA KPI 3
KPI 2a	Net attributable incomes increase of all farm households under $2.00PPP poverty line	Rp. 746,735,478	Aug-16	
KPI 3	Number of ISPs or SMEs with increased turnover	17	Jul-16	
KPI 4	Value of additional turnover of ISPs or SMEs in IDR	Rp. 1,322,880,000	Jul-16	
KPI 5	Number of innovations introduced by private sector	6	Jul-16	Does not include IPM because no PS partner yet/includes sheep as separate
KPI 6	Number of initiatives taken by government to improve BEE	2	Jul-16	beef, cassava
KPI 7	Number of intervention partners (public sector and private sector)	8	Jul-16	Maize: 2 Beef: 3 Cassava: 1 (partnership agreement not yet signed) Sugar: 1 (partnership agreement not yet signed) Dairy: 1 (same as above) IPM: 0 By September 2016, this total number is expected to be 14
KPI 8	Value of investment by private sector partners (incl. ISPs/SMEs) in IDR	Rp. 1,549,740,000 (Est. Rp. 1,096,720,000 for Y16S1 only)	Jul-16	
KPI 8b	Value of investment of research institutions	Rp. 1,353,510,000 (from Oct 2015-June 2016)	Jul-16	

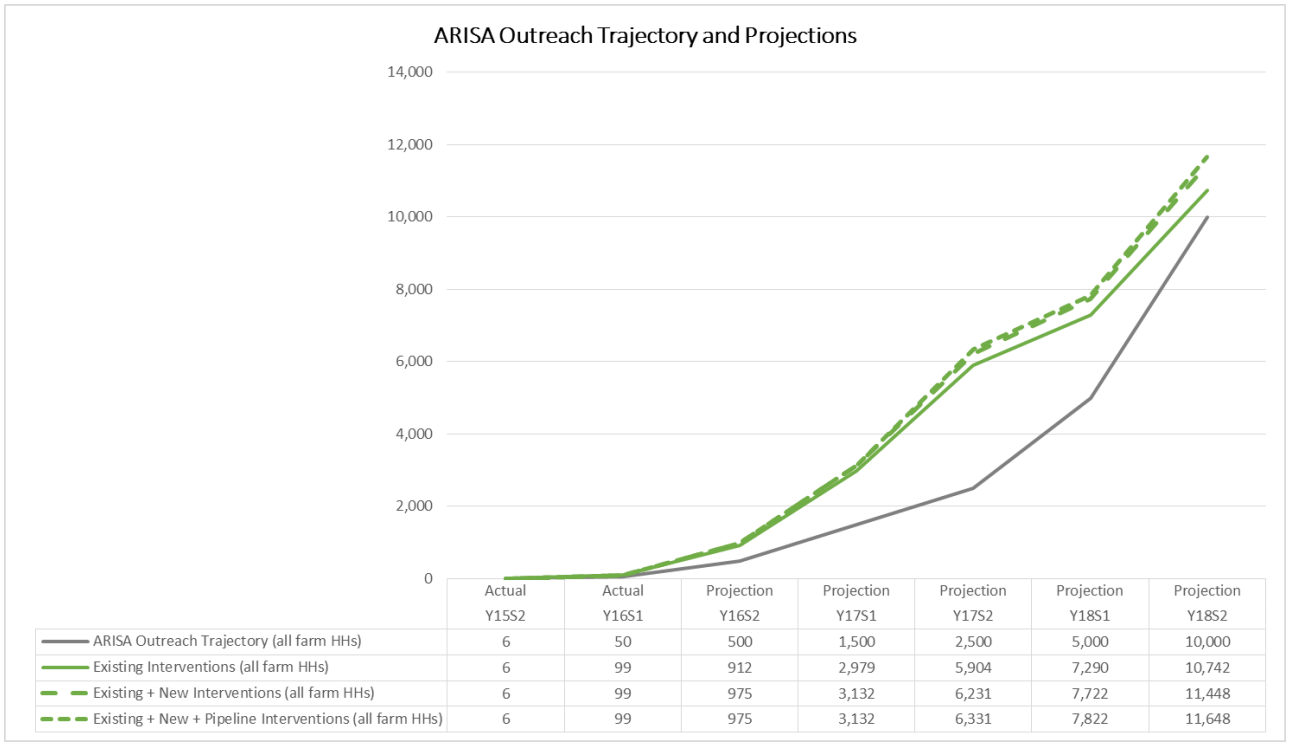


Figure 1. ARISA Outreach Trajectory and Projections

5. COMMUNICATION

Through PRISMA, AIP-Rural has established a website. ARISA has upload content to the website about the project. A series of two-page descriptions for each of the interventions has been developed and are presently being reviewed by the AIP-Rural communications team. These will be placed on the website and used as general communications about each intervention for the MTR and with stakeholders.

In addition, two stories on the cassava intervention have been developed by the PRISMA communications team. The focus is on the benefits of the cassava innovation partnership for women and the environment. Other communication pieces being prepared for the MTR are a short paper on ARISA's approach to gender equity and women's economic empowerment; a two-pager on innovation policy in Indonesia and how this relates to ARISA; and a two-pager on the interface between research institutions and the private sector to catalyse innovation.

A number of information sharing sessions have been held with PRISMA and Andrew Ash has provided information to PRISMA on the potential impacts of La Nina.

6. CAPACITY BUILDING

In the last 6 months capacity building has had five prongs. Firstly, the focus was on ensuring that the new interventions, namely dairy, cassava and sugar, received the basic capacity development components developed by ARISA, including:

- international best practice in partnerships and the development of a partnership agreement;
- gender equality and women's economic empowerment (WEE) to ensure each intervention is in line with the DFAT requirements [1] to ensure as a minimum 'no harm' is done to women and where possible interventions enhance the economic development of women; and
- ethics to ensure that all partners understand how to operate in an ethical manner and meet CSIRO's obligations under the Australian National Statement on Ethical Conduct in Human Research (2007).

During a 3 day workshop, this capacity building was undertaken in February with UNEJ, PT. Bangkit Cassava Mandiri (PT. BCM), Bina Sejahtera Coop (Farmer's Group) and Bangkit Mandiri Sejahtera Coop (Farmer's Group) and a partnership agreement drafted for the cassava intervention. Also in February, a 3 day workshop was held with P3Gi, University Tronojoyo and PTPN X to draft a partnership agreement for the sugar intervention. In April a 2 day workshop was held with PT Nestle and UNBRAW during which the partnership agreement was drafted for the diary intervention.

The second prong of capacity building has been around the ***MEL*** The 3 new interventions (i.e. cassava, sugar and dairy) have had support in developing the DCED standard results chain, business model and monitoring plans, as well as developing the on-the ground monitoring. The two older interventions (i.e. beef and maize) have received on-going mentoring on changing the results chain and business models as the interventions have evolved. The cassava and beef interventions have provided positive feedback on the usefulness of the MEL and the value they see for future projects.

The third prong of capacity building has revolved around the 6 to 8 monthly ***progress review and partnership reflection*** of the beef and maize interventions. During this process partners have reflected on progress of each intervention, the progress of the partnership, challenges experienced and moving forward strategically. The discussions resulted in a number of strategic changes to the innovation partnerships and

[1] The main DFAT gender equality documents are Aid framework (2014) and Operational Guidance on Women's economic empowerment and gender equality in Agriculture (2015),

business models. During the maize workshop, ACS formally withdrew from the partnership and the remaining partners discussed options to bring in a new partners to assist with financing and purchasing of the maize. During the beef workshop, it was identified that additional partners were required to purchase cattle, as due to low prices in Jakarta and exports to Malaysia, PT Dharma was unable to purchase animals above market prices. UNRAM has subsequently negotiated with PEPEHANI Association to join the partnership and they have been included in the beef agreement.
Overall the capacity building on partnership has been very positive and the interventions understand the value of having a process where open dialogue is encouraged to catalyse changes to the agricultural system which then benefit smallholder farmers, as well as strategic direction in the business innovation model (See Box 1).

The fourth prong of capacity building has been specific ***technical support*** for partnerships by Australian researchers, including:

- Neal Dalgliesh into the maize intervention. He has had ongoing interactions with UNRAM following visit in December.
- Mike Webb into the cassava intervention on cassava nutrition and production. He visited twice in last 6 months and is returning in September.
- Graham Bonnett into the sugar intervention on agronomy and whole sugar farming system. He will visit again in the next semester during the dry season.
- Andrew Ash into the beef intervention on forages.

The final focus of capacity building is based on the recommendations from Tim Stewart's reports to focus on re-inforcing the business like behaviour of the research instiutions by making them more outward looking and to develop business champions with these institutions. As a pilot an ***innovation week*** is being hosted by the UNEJ between 31 August and the 3 September. This will include a symposium during the week to promote interactions between UNEJ agricultural researchers, companies and the government with the aim of creating (a) dialogue about future research required by the private sector and (b) research which exists but has the potential to be commercialised, in order to develop innovation partnerships. The outcome of the event will be to identify **actions** to move forward with the project ideas between researchers and the private sector, as well as identification and prioritisation of capacity building needs which ARISA could support over the next year.

In the next semester the focus of the capacity building will be on institutional change within the research institutions so that they become more outward looking; they developing key business skills; are able to market their research; and focus on the commercialisation of their research.

7. GENDER

The main milestones for this semester was the development of the *ARISA Gender Inclusion Strategy* and *Gender Mainstreaming Guide*, completion of the gender capacity building, as well as gender activity intervention plans for the older partnership interventions based on the women's focus group discussions (FGDs). The Strategy and the Mainstreaming Guide are consistent with the approach that PRISMA is taking but explains the differences in some of the approaches being used by ARISA partners, including the main focus being on women's economic empowerment of smallholders.

All of the interventions have completed the gender capacity building. The beef, maize and cassava partnerships have undertaken their women's FDG's and the reports have been completed with recommendations. Each of these interventions has identified specific interventions to support gender equality and WEE, with a focus on 'do no harm'.

Based on these plans the partnerships have started to implement their gender activities. As beef production is largely male dominated, this partnership has developed a gender sensitisation for farmers and other stakeholders. The training emphasises the benefit of women engaging in cattle raising as it increases productivity and therefore household incomes. Specific women-orientated capacity building activities will be undertaken in September. Balinese women on Sumbawa will receive more technical training as they are already engaged in cattle rearing (e.g. animal health, better feeding, diet variation, high protein feed). For Sumbawese women training will be focused on encouraging participation initially via a cross-visit to Balinese women and basic skills development (e.g. animal maintenance, feed and feeding, caring for animals).

The maize intervention is dominated by women and therefore the focus is on ensuring women have access to technical support on growing maize and mungbean. Syngenta actively supports the training of women. A cross-visit will be organised between the women in the north, who have already successfully adopted the techniques, and those from south east. In addition with SAFIRA options will be investigated for credit for women as they control the household finances in Lombok.

There is a large potential for WEE in the cassava intervention women are actively involved in the growing and harvesting of cassava and in the processing in the chip clusters. 230 jobs have been created in the clusters, MOCAF outlets and coops, the majority of which women are engaged in. UNEJ is focusing on the capacity building of women in production. PT BCM is working closely with women to develop skills required in the processing. The activities will be further refined during the 6 monthly review in July.

Sugar and dairy are presently planning their FGDs for August. These will be used to develop their gender activity plan.

As a result of the gender training shifts in thinking and attitudes have been observed in some of the research institutions and companies. The UNRAM gender specialist is now being actively supported to develop trainings for women and men. Senior male staff in UNRAM and PT Dharma are actively supporting interventions with women acknowledging having women involved in cattle rearing improved productivity and therefore incomes. Syngenta has openly acknowledged that they see women as a market for their seeds and therefore they need to be involved in the capacity building at the Training Centres.

One constraint has been the collection of sex disaggregated data. This has been partially applied but due to constraints in MEL capacity this has not yet been completed. The M&E Manager will focus on this area in the next 6 months.

8. RESEARCH

(a) **Innovation systems research**

Two areas of research have been progressed since the last semester report.

Understanding the innovation landscape and options for policy dialogue:
CIPG was commissioned to provide an overview of the Indonesian innovation landscape – covering the key strategies and programs of relevant Ministries and other actors. Both the report and discussions with CIPG have highlighted a significant appetite for the promotion of public-private sector partnerships for innovation, with a multitude of programs within and across different Ministries in addition to various initiatives outside government programs (Appendix 5). Initiatives within government span from focusing on infrastructure (eg. through science and technology parks and business incubators) to provision of grants (which tend to focus on funding of research). The challenge of the schemes is not their design per se, but the capability for implementation in a relatively new space or approach.

A key challenge is therefore how to best add value within what is effectively a crowded and messy arena, with many programs overlapping and little coordination or communication across ministries and programs. A number of options have been defined and will be explored further with relevant stakeholders. These include:

- Working through institutional entrepreneurs in public research institutes. A number of key champions have emerged through the intervention process who are committed and well connected to facilitate broader change within the university given support by ARISA.
- Structuring the partnership with RISTEKDIKTI as a learning alliance. RISTEKDIKTI provide an entry point into high level dialogue through which to share lessons and challenges from ARISA. Structuring the partnership around evaluation and learning rather than implementation could be a useful way of progressing a dialogue based on insights across both ARISA and RISTEKDIKTI.
- Act as a hub for sharing experiences spanning a range of other public-private partnerships for agricultural innovation. In this option ARSIA would act as a policy learning broker, with an organisation such as CIPG acting as a locally-based implementer. This would be a more resource intensive, more encompassing version of the learning alliance option with RISTEKDIKTI.
- Form / join a policy engagement coalition. Avoiding duplication of related efforts of DFAT and others, this option could see, for example, a strategic partnership with the Knowledge Sector Initiative, with ARISA specifically leading efforts related to agricultural innovation policy.

This is not a definitive set of standalone solutions – it is expected that a combination of options are will be considered and adapted based on stakeholder feedback and interest.

Capturing the experiences and lessons from each of the interventions through Innovation Practice Logs:
A focus of the innovation research over the first half of the year has been to document initial experiences and perceptions of the partnerships from the perspective of different team members. Documenting and analysing the experiences, perspectives and evolution of the partnerships from the perspective of the actors involved will provide an evidence base and set of insights to feed into a) adaptive learning within each of the interventions; and b) dialogue within the higher level institutional and policy environment.

The first round of interviews with project partners have been completed for all interventions except IPM, where the decision was made to wait until there was a clearly established university partner. Examples of practice logs are provided as Appendix 6. The details outlined in the practice logs reflect the diverse circumstances of the organisations involved and the maturity of the partnerships themselves.

From the university perspective, practice logs highlight that although there is strong encouragement from management to engage in partnerships with the private sector, the current incentives and mechanisms within the universities to support these partnerships are missing. Past experiences of university team members in working with the private sector has usually been limited to the provision of clearly defined services, such as impact assessments, contracted individually and endorsed by the university, rather than genuine collaborative partnerships. Where partnerships have gone beyond this, it is likely to be due to the drive of key, highly dynamic individuals (‘institutional entrepreneurs’). The sugar intervention involving P3Gi provides a stark contrast, where the withdrawal of public funding is driving changes in how P3Gi is trying to work with the private sector.

Partnerships that have been operational for longer, such as between UNRAM and Syngenta, highlight a shift in perceptions from both parties in what can be gained by partnering – such as the legitimacy gained by Syngenta in being associated with the UNRAM, which facilitates better communication with farmers, and the role for Syngenta in scaling out technology to a degree the University would not have been able to resource.

The next step in this process is to share or report back to the project partners and get their feedback and responses. It is anticipated that this will be combined with the Partnership Reflection process. Interviews will be repeated in 2017 to track change over time.

(b) **Economic analysis of intervention value chains**

To achieve this objective the economics researchers have been working with ARISA's in-country Results and Engagement Manager (Lauren Xie) and the intervention teams. Part of this work has involved adapting their monitoring and evaluation baseline survey questionnaires to incorporate additional data for on-farm cropping and livestock management systems including resource availability (e.g. land, labour), input-output relationships, output and input prices etc. To date, this has been focussed on the Sumbawa beef, Madura sugar, Jember MOCAF and Malang dairy case studies. Baseline surveying for these three regional case studies has been completed by the case study teams (Beef - February, Sugar- May, MOCAF – May, Dairy - June).

In parallel to the survey collection of farm-level data, the economic analysts have made a number of field visits to collect data by interviewing key value chain actors in each of the intervention sites. With these data, value chain models for both the Sumbawa Beef and Jember MOCAF interventions have been built to assess the economic impacts of the project activities on project farmers and value chain actors alike. These models have been set up in the system dynamics software iThink and have already yielded useful insights for improving project design. For example, analysis of the beef project has helped to quantify the volume of young bulls which must be purchased from beyond of the project area to capitalise on legume planting and feedlot investments, and meet project performance targets. The additional potential and constraints associated with scaling up these purchases is also currently being explored. This modelling has also helped quantify additional gains from the coupling of investments into breed herd management and feedlot systems. Significantly, these additional gains take several years (beyond the current ARISA project horizon) to be fully realised. One of our economic analysts had a working session with UNRAM team members in mid-July to share findings, incorporate recent unforeseen events into value chain model (such as adverse weather conditions from El Nino and a deterioration in the market price of beef) and to develop an outline for a joint journal paper on the analysis. The preliminary value chain model for the cassava project has generated very promising results, revealing that the project should easily meet and possibly exceed its goal for improved farmer incomes. This has helped to make the case for an expansion of this project's scale and share within the ARISA portfolio. The modelling work has also brought challenges around highly seasonal income flows into focus, demonstrating the need for additional stable income sources from companion enterprises such as sheep fattening.

The representative smallholder farm structures, once characterised including the identification of specific parameters that have a significant effect on farm performance, will also be incorporated within the value chain models. The synthetic household budgets can provide a check on the results of the benchmarking surveys and also identify significant performance variables for ongoing scrutiny under the monitoring and evaluation programs for each of the case studies.

The economics researchers have prepared all of the estimated percentage changes in net income for all of the interventions, which will be used for the MTR.

9. BUDGET

Expenditure on project management (Australia and in-country) is in line with the budget for this semester (Table 5). The operational budget is somewhat underspent but with interventions now being implemented it is starting to ramp up and is expected to be closer to planned by the end of the 2015-16 financial year. The delays in procuring a local HR company has also delayed expenditure on local staff but the HR contract has now been agreed and executed. A signed financial acquittal is provided in Appendix 7.

Table 5. January to June 2016 and whole of financial year (2015-12016) expenditure.

	Jan 1 –June 30 2016	2015-16 Financial Year
CSIRO Project Labour	$202,544	$357,874
CSIRO In-Kind (Project support and overheads)	$214,766	$378,750
Travel and Operating (includes in-country labour costs and interventions)	591,271	$1,141,792
Total	$1,008,580[A]	$1,878,416
Balance carried forward into 2016-17		$1,004,039[B]

[A]Financial acquittal (Appendix 7) includes only DFAT expenditure and does not show the CSIRO in-kind component of expenditure ($214,766).

[B]It is anticipated that nearly all of the carry forward will be expended by the time the next payment is due in January 2017.

10. CONTRACTED MILESTONE DELIVERABLES

A summary of progress against each of these milestones is given below.

I. At least 8 RI-PS collaborations are negotiated and signed.
At least 8 credible business plans are elaborated between RI and private sector collaborators

Six interventions have been negotiated and implemented and have credible business plans agreed by all partners. One intervention is being held over to be implemented in partnership with RISTEKDIKTI and discussions have commenced on possible interventions. Based on a discussion at the March 2016 Strategic Review Panel, it was suggested by the SRP that more emphasis be placed on achieving the target impact in ARISA (10,000 farmers) than being driven by the intervention numbers. It was recommended that if opportunities were available to further scale existing interventions more cost-effectively than implementing new interventions then that was considered to be a preferred course of action.

In response to the SRP meeting, additional resources are being put into the cassava and IPM interventions as there is good potential to achieve additional scale-out. Taking that course of action has put projected outreach numbers back on track. At the same time, opportunities for new interventions are being explored, particularly in NTT, where ARISA has not yet been able to find a RI-PS partnership and intervention that would deliver credible impact. A budget item for emergent opportunities will be used to explore those opportunities.

II. At least 4 collaborations are operational and producing results

All six interventions and four of these are producing tangible results. The dairy and sugar interventions commenced early in the 2016 calendar year and so are not yet producing results in terms of outreach, although farmers have been recruited into the dairy and sugar interventions. Almost 700 farmers have adopted the technologies in the interventions in this first growing season.

The maize intervention had 50 farmers in the pilot year adopt the hybrid maize, planting configuration and fertiliser placement technologies. Despite an El Nino year, yields were on the whole very good, averaging 6 to 7 tonnes/ha, with the grain being of a high quality. Input credit remains a challenges and ARISA is working with SAFIRA to address this challenge. Syngenta is pleased with the outcome and wants to expand their footprint in Lombok in the maize sector.

The beef intervention, based on leucaena feeding systems, has seen around 200 farmers commencing to grow leucanea with the new Taramba variety, whilst other farmers commenced feeding leucaena to cattle

wild-harvesting of older varieties. The meat processing company PT Dharma Raya has not been able to participate as actively as planned because of high beef prices in Sumbawa, exacerbated by decreasing beef retail prices in Jakarta due to an increase in meat imports. The trader association, PEPEHANI, and individual large traders have been brought into the intervention to strengthen it.

The cassava intervention has recruited over 200 farmers who are growing newer varieties of cassava and applying new fertiliser practices, including use of composted manure. A new MOCAF processing plant (cluster) has been established which provides technology advances in use of waste products for fertiliser and sheep feeding. Local entrepreneurs are building new MOCAF clusters and PT BCM is providing technical support and loans to cluster owners and arranging transport of cassava to the mill.

The IPM intervention with shallots has completed its pilot phase in both the dry season and wet season, demonstrating good success in reduced input costs of pesticides which lifts net incomes by 30-50%. This intervention is now being operationalised in partnership with PRISMA. Companies involved include PT NASA and NuFarm.

III. Participating RIs commit to financing 30% of their intervention

The Research Institutes are providing the costs of existing staff salaries, research institute facilities, and most administrative costs as co-investment in the interventions. Intervention money is mainly used for operational aspects of the intervention e.g. equipment, travel, chemicals/fertiliser, on-ground contracted staff to assist in implementation of the intervention.

Current committed co-investment as a % of direct intervention costs are: Cassava - 61%, Sugar - 40%, Dairy - 28%, Maize - 16%, Beef - 54%. Over all interventions this averages out at 40%.

IV. Participating private firms commit to financing 50% of their intervention costs

Investments from the private sector are still ramping up. There is relatively little direct funding being provided to private firms so “financing 50% of their intervention costs” is not really an appropriate indicator. However, as part of the interventions, private sector partners are providing significant resources and co-investment as outlined below based on commitments to the partnership. An assessment of investment to date is being undertaken with each of the private firms and this will be available in the second half of 2016.

1. Maize – Syngenta is providing salary support to field officers and has established two Learning Centres in East and North Lombok. This is valued at 133M Rp in salaries over 3 years, and 300M Rp in establishment of Learning Centres, leasing of land from farmers, and operating costs. ACS was part of the intervention and their contributions were significant in salaries and low-interest loans. However, they have withdrawn from the intervention as a result of a new business owner shifting their business focus. We anticipate increased contributions from Syngenta as their interest in maize in Lombok grows.

2. Cassava – PT Bangit Cassava Mandiri (BCM) are providing around 25 Bn Rp in support to the intervention in the form of market guarantees and technical and commercial support to the cluster owners. The Cluster Owners are providing the funding to build the processing plants with some modest support from ARISA in the additional processing facilities to support use of by-products in fertiliser and sheep feeding.

3. Dairy – Nestle is providing around 1.2 Bn Rp in support to the development of fodder farmers through development and training (staff provided in the field) and in equipment support for the improved dairy management practices e.g. carpet, water troughs, milking equipment.

4. Beef – the main contribution from PT Dharma is in providing a market premium for leucaena fattened cattle and in capacity building of farmers. Given the unfavourable market conditions for purchase of Bali

beef in Sumbawa, this contribution is not yet happening. Negotiations with large traders has involved them providing training for farmers and in one case provision of leucaena planting material.

5. Sugar – the company PTPN X is providing 730M Rp in quantifiable inputs that include (a) use/rental of land for demonstration sites and their implementation, (b) land preparation and the use of agricultural tools and machines, (c) contribution towards training events, and (d) deep tube well and other irrigation equipment.

In addition to this, PTPN X offers very significant co-investment, which is not yet quantified:

- contracting of the smallholder farmers to give a guaranteed market linkage.
- arrangements for the supply of credit to the contracted farmers.
- commitment to improve the arrangements for the harvest-loading-transport process for the sugarcane harvest.
- provision of a minimum guaranteed price through the contracting between company and smallholders.
- guaranteed minimum sugar extraction rate of 8% for contracted farmers.
- commitment to improve to the extraction efficiency for sugar and molasses, and to put in place processes to ensure that the value add is captured by the contracted smallholders.
- in the longer term, commitment to build a new processing factory in Madura.

(V) A further 6 credible RI or private firms have been assessed and ranked for their suitability to receive collaboration grants

As part of the process of assessing the around 100 Expressions of Interest and other unsolicited bids, a short list of RIs and private sector companies beyond the interventions originally funded have been assessed for suitability for receiving collaboration grants. These have included tamarind for livestock feeding in NTT, seaweed in NTT, agricultural processing technology at village/community scale in NTT, cocoa plantation rehabilitation in NTT. After in-depth assessment of these bids none have yet proceeded due to market linkages being too weak, potential impact numbers being too low, or the research institute staff not having the capacity to implement the intervention.

We would like to have a successful intervention developed in NTT and so the process of exploring new partnerships between private firms and RIs is continuing. The new Intervention manager has good contacts in NTT and we are using those networks to explore further opportunities, noting that within the budget there is only capacity for one or possibly two additional interventions.

11. MANAGING RISKS

In the ARISA Design document, a number of risks for the project were identified and mitigation actions described for each risk. Table 6 below details how are progressing in managing the risks, which suggests that most risks are being managed well. However, it is too early to determine whether some of the risks can be adequately mitigated e.g. not achieving scale out of interventions.

Table 6. Actions to mitigate project risks identified in the ARISA Design Document.

Risk Event	Progress in mitigating risk
CSIRO confronts difficulties in establishing an Indonesian office and managing project operations with the Government of Indonesia and Research Institutes	The challenges with sustaining an ongoing relationship with BPPT has been mitigated by forming a partnership with RISTEKDIKTI and their Innovation Division. The required MoU and IA are being finalised and we are confident a strong collaboration can be developed with RISTEKDIKTI.
The project's theory of change for public-private partnerships is not supported or is not amenable to Research Institutes in Indonesia	There continues to be strong interest shown by the Research Institutes, as evidenced by the ongoing commitment to interventions from the RIs. We are continuing to build capacity with RIs so that they see their role as part of a system that is adding value rather than as implementers of applied research projects.
Private local investors are not attracted to join the interventions.	There is good private sector involvement in all the interventions progressed to date. In two of the interventions (maize and beef) changing market conditions has meant that one of the private sector partners in each of the interventions has not been able to maintain a high level of involvement. This highlights the need to try to build interventions with diversity of private sector engagement, particularly where private firms are small or medium enterprises.
The project outputs do not lead to development outcomes at scale.	All intervention projects that have progressed to full proposals have a clear strategy for directly engaging significant numbers of smallholder farmers (on average around 1000 farmers) each with an expectation that there would be copying and crowding in through time. With the arrival of an Intervention Manager additional effort is being put into managing the risk of not achieving scale by exploring additional options within intervention value-chains. External risks associated with climatic extremes or sudden market disruptions are more difficult to mitigate. Seasonal climate prediction can be used to help manage some risk.
The development agenda of DFAT and AIP-R overrides the research for development agenda of CSIRO and the Indonesian Innovation Systems	Maintain regular progress updates with the Secretariat and DFAT and address concerns as early as possible.
Reputations of Australia, CSIRO, DFAT or a core Indonesian partner is damaged by events during implementation	The project team is trying to operate in a consultative and participatory way so that expectations are managed, processes are ethical, and risks are clearly explained. An ongoing challenge/risk will be that the applied research nature of the interventions means that some may fail and managing the negative consequences of that for smallholders needs to carefully considered.

12. WORKPLAN FOR NEXT 12 MONTHS

Table 7. Workplan for the period July 2016 – June 2017.

	Month 1-6	Month 7-12
Overall Program Management	• Third Milestone Report (as part of Semester Report) delivered to DFAT • Produce required documentation for the Mid-Term Review in a timely manner • Ensure new personnel arrangements meets ARISA's needs • Rob Caudwell to oversight management of three new in-country staff	• Fourth Milestone Report (as part of Semester Report) delivered to DFAT • Implement recommendations/actions from the Mid-Term Review and report back to SRP on progress • Review portfolio of interventions to endure overall ARISA projections are on track
Intervention Management	• Continued implementation and adaptation of six existing interventions • Implement additional scaling of cassava and IPM interventions • Develop new intervention with RISTEKDIKTI • Explore options for new "fast-start" interventions, with a focus in NTT • CSIRO technical input through targeted missions into cassava, sugar, maize and dairy interventions and input into IPM intervention from IPM Technologies • Develop methodology and approach for extraction of lessons learned from the interventions • Start-up of 1-2 new interventions (e.g. with RISTEKDIKTI and one fast-start in NTT).	• Continued implementation and adaptation of six existing interventions • Continued implementation of recommendations from MTR • Continued technical assistance from CSIRO & IPM Technologies • Extraction and sharing of lessons learned from the interventions • Roadshows with intervention champions for key decision makers in Indonesia (public & private sector).
PCC	• PCC meeting with Indonesian sponsor (RISTEKDIKTI) • BAST report completed	• PCC meeting RISTEKDIKTI • Visit interventions in East Java
Results Measurement & Learning	• Baseline studies and impact projections completed for all interventions • Documentation incorporated into MIS • Pre-audit preparations with Hans Posthumus and Phitcha Wanitphon • Ensure new MEL manager can take over day to day running of DCED system • ISDs developed for 1-2 new interventions • Improved feedback mechanism of results and lessons learned from MEL back to intervention teams	• Full DCED Audit undertaken • MEL capacity building with RISTEKDIKTI

	Month 1-6	Month 7-12
Research and Capacity Building	• Partnership and reflections workshops interventions • Continue interviews with RIs to develop innovation practice logs • Capacity building developing skills re-enforcing business-like behaviour in RIs • Innovation Systems paper completed • Initiate discussions with key innovation policy areas in RISTEKDIKTI, Industry and Finance to develop longer term collaboration • Data collection in in economics/value chain research in dairy and sugar interventions	• Cross-visit to Australia by key innovation champions • Capacity building developing skills re-enforcing business-like behaviour in RIs
Communication	• Two public outreach activities held (cassava and beef) relevant to two RI-PS interventions • Finalisation of initial factsheets and stories • Produce three additional factsheets and one new story • Update website as new material becomes available	• 2-3 new stories on innovation, gender and partnerships • Two public outreach activities on interventions (Maize and Sugar)

Appendix 1. Actions in response to Secretariat recommendations flowing from Tim Stewart's Report on ARISA Interventions

1. **Action:** A quick review of all interventions seems to be in order to assess the current state of: private sector engagement, commercial viability of the proposed innovation, potential of the intervention to reach some scale, business like capacity needs of the partners and results measurement plans. The aim of the review would be "refocus" some of the interventions (based on the above mentioned recommendations), "drop" or "scale back" some others and "redesign" some of those in the pipeline of the portfolio. It might be helpful to involve Tim in this review.

   Response: Tim Stewart spent a day with the Team Leader in early May 2016 going through the interventions and how they were being reshaped in response to recommendations from Tim's March report. The Team Leader and Grants Manager then spent time with Jim Tomecko in mid-May going through the review and modifications in each of the interventions. This process was repeated with Jim Tomecko and Daniel Nugraha in mid-July. A summary of the review and refocusing of the existing interventions is provided in the body of the Semester report. The documentation for the review/refocus of the interventions is being provided to the Mid-Term Review.

2. **Action:** Conceptualize a possible 2nd generation of interventions that are mentioned in the report by Tim Stewart. These might be smaller, easier and less expensive interventions where the private sector takes on a lead role with the RI's being used more as contractors.
   Response: This approach is being implemented in new interventions. The ARISA team spent quite a lot of time on working up an intervention proposal with PT Kopernik involving local scale processing technology in NTT and contracting a local university. Ultimately, based on Secretariat feedback this intervention has not proceeded because the intervention was too dependent on uncertain market linkages.

   The IPM intervention is also now following this model with UGM and potential other research institute providers being contracted for specific technical aspects of the intervention. In effect this is also happening in the dairy intervention, which is being implemented by Nestle at the farmer scale with UNBRAW having a specific role in fodder evaluation to support the fodder farming initiative being fostered by Nestle.

   Smaller scale "fast start", shorter term interventions are also being scoped with companies where there are opportunities for fairly rapid impact and technical input from research institutes is short-term. For example, ARISA is currently exploring with PRISMA a potential intervention on pig rations which would complement the current PRISMA pig intervention in NTT.

3. **Action:** Develop a program for the RIs, with which ARISA wants to continue, aimed at improving their capacity to be more demand oriented and business-like in marketing themselves to the private sector and in dealing with these companies as clients.

   Response: There are two elements to this action. First is the ongoing capacity building that is occurring within each of the interventions. There are specific workshops, held six-monthly, that focus on the private sector partnerships and these are proving to be having good positive impact in changing the thinking and orientation of researchers in private sector engagement. In addition, there are specific events being implemented. For example, the Innovation Fair in Jember and the associated research-private sector symposium is aimed at encouraging researchers to be more demand oriented. Another specific capacity building event bringing together different research institutes is planned for later in the year.

We are also exploring whether a capacity building model developed in CSIRO (AcceleratiON), which takes researchers "off line" and helps them to prepare pitches, better understand private sector drivers, and work up specific technology solutions to sell to industry, can be applied in the Indonesian setting.

4. **Action:** Develop specific actions related to how ARISA can take advantage of the competencies that exist within AIP-Rural, specifically through more substantive interactions, use of systems, personnel, joint meetings, etc.
   Response: This is now occurring more effectively at two levels. First, at the level of interventions ARISA is now connecting more effectively with PRISMA and SAFIRA e.g. maize and IPM interventions and in any new interventions we are looking to link more strongly with PRISMA. The second area is within monitoring and evaluation systems. Lauren Xie has been working closely with the Secretariat on the MIS system and associated components such as attribution, indicators etc.

5. **Action:** Increase the personnel capacity of the ARISA team, as soon as feasible, to take on more intervention management tasks as called for in the report.

   Response: An intervention Manager and Finance/Admin Officer commenced on June 1st and a Monitoring and Evaluation Manager is commencing on September 1st. We have also increased the project management function in ARISA with Michaela Cosijn providing project management support from January 1st 2016.

6. Bring in short term expertise to assist the results measurement personnel to right size their measurement system while still complying with the standards of the DCED.
   Response: This is occurring in three ways. Hans Posthumus has been contracted from March until December 2016 to help further refine the measurement system in addition to undertaking a pre-audit. With the M&E Manager commencing on September 1st, we brought in a short-term consultant to provide support to Lauren Xie in preparing for the MTR in September. Further, high level DCED consultant input is being contracted to assist in "right-sizing" prior to the DCED audit in March/April 2017.

Appendix 2. Economic Analysis of IPM on Wet Season Shallot in Probolinggo and Pare

Analysed by Joko Mariyono

Preface

The main constraint of shallot farming in wet season is yield loss associated with diseases. Different from insect pests such as *Spodoptera exigua* and *Lyriomisa sp*., infestation of diseases is nor recoverable. The main disease is wilt caused by Fusarium sp. The potential loss caused by this disease is up to 100%. The strategy of controlling diseases is totally different from controlling insect pests. To overcome such problem, the shallot should be protected from disease infestation.

During wet season, it does not necessary mean that farmers ignore the insect pests. This problem still exists, even though the level of infestation is considered low. Farmers still need to control insect pests to reduce population in the coming dry season. In this case, integrated pest and disease management (IPDM) need to be introduced to farmers during wet season.

Practical IPDM technology on shallot has been introduced to farmers in Probolinggo and Pare. The total number of farmers participating the demonstration trials is 13 farmers (4 in Probolinggo, 9 in Pare). They provided half plot of shallot farming to be applied with IPDM technology. For comparison, farmers applied usual practices to half of plot.

For disease side, the components of IPDM practices include *Trichoderma sp* and *Gliocadium sp.,* which are antagonistic fungus that are able to control Fusarium with and other diseases caused by fungi. Application of these agents should start from land preparation and bulb treatment. The use if these agents will be more effective if applied with organic fertilisers, such as green manure or compost. Application in early stage of farming is to some extent still allowable. The use of strong fungicides will not be compatible.

For pest side, the components include *Baccilus turingiensis* (BT) and selected soft insecticides. The selected insecticides and fungicides are considered not harmful to beneficial. Application of Bt and selected insecticides were based on bi-weekly monitoring of crop condition. Application of BT and selected insecticides were recommended when field observation found insect pests. The main insect pests were *Spodoptera exigua* and *Lyriomisa sp*. Spray used single agent, either BT or insecticides. Farmers still needed to do hand-picking of insect pests both for egg mass and larvae.

Farmers' practices used mixed (cocktail) insecticides and fungicides are mostly incompatible to IPDM technology since those chemicals kill beneficial. The applications of insecticides were conducted as per schedule and farmers' perception of pest control. To convince the participating farmers, there was a guarantee (a kind of insurance) of failure. If the IPDM technology results in lower net income, then farmers will get compensation. The compensation is the gap between net income of IPDM technology and that of farmers' practices.

Economic Analysis

To understand the superiority of IPDM technology, economic analysis was conducted to convince farmers. Economic analysis was conducted using partial budgeting approach, where only different factors associated with IPDM from current farmers' practices were analysed. In this study, only costs of insecticides, labour cost of spraying and yield of each treatment were applicable to this analysis. Relative economic superiority of IPM was determined using formula as follow:

$$\Delta\pi = (R_{IPDM} - R_F) - (C_{IPDM} - C_F)$$

where $\Delta\pi$ = change net revenue comparable to farmer practices, R_{IPDM} = Revenue of IPDM technology; R_F = Revenue of farmer practices; C_{IPDM} = cost of IPDM technology; C_F = costs of farmers' practices. The economic analysis was based on prevailing prices of insecticides and harvest. Composite prices of fungicides and insecticides applied since farmers use more than two fungicides and insecticides. The prices of IPDM components were based on local market prices.

Result and discussion

The results of analysis are presented below.

Table 1. Number of chemical sprays and hand-picking

Site	Farmers	Farmers' practices			IPDM practices			
		Fungi-cides	Insecti-cides	Hand-picking	Bio-agents*	Fungi-cides	Insecti-cides**	Hand-picking
Pare	Slamet	13	13	0	4	4	9	0
	Misri	10	10	2	4	7	6	2
	Mujiono	14	14	4	4	8	8	4
	Masiran	9	9	3	4	0	10	0
	Ali	4	10	0	4	0	13	0
	Marji	14	14	4	4	0	13	4
	Purnomo	12	12	3	4	0	9	3
	Tobiin	6	18	0	4	3	14	3
	udiyono	6	10	2	4	5	7	2
Probo-linggo	Iwan	12	2	4	4	0	8	2
	Sarif	24	2	2	4	0	12	2
	Sambang	10	6	3	4	4	9	2
	Nahrowi	20	10	0	4	1	16	0
	Average	11.8	10.0	2.1	4.0	2.5	10.3	1.8

Note: Farmers' practice use 3-4 pesticide mixtures. *Bio-agents include Thrichoderma sp, and other beneficial fungi and bacteria. ** Insecticides include Volliam Targo, Macht and Bt.

Table 1 shows that IPM technology technically superior to farmers' practices in terms of number of fungicide sprays. But, IPDM technology needs additional agents such as organic fertilisers, Trichoderma and others. Number of insecticides sprays and hand-picking actions in both practices were almost similar. This is because problem of insect pests during the wet season was not very important.

Table 2 shows that the costs of farmers' practices were consistently higher than that of IPDM technology. The revenue of farmers' practices and IPDM technology was almost similar. The profit of IPM technology was consistently higher than that of farmers' practices. This means that IPDM technology was more profitable that farmers' practices.

Table 3 shows percentage changes in yield and profit. On average, by implementing IPM technology in shallots, the profit can increase by about 30%. The profit mostly comes from reductions of costs and increase in yield. Note that the negative changes in yield and net revenue is because of unfair plotting. These farmers put IPDM plots in the lower level of land and shaded areas. Thus IPDM plots underwent flooded and lack of sun light in the morning. The IPDM plots of these farmers suffered from severe infestation of fusarium wilt when the crops were about 45 days after transplanting. Farmers harvested soon after observing the infestation.

Table 2. Cost, Revenue and Net Revenue (IDR million/0.1ha)

Site	Farmers	Farmers' practices			IPDM Technology		
		Costs	Revenue	Net revenue	Costs	Revenue	Net revenue
Pare	Slamet	1.30	16.61	15.31	0.92	18.92	18.00
	Misri*	1.05	2.89	1.84	0.99	1.74	0.75
	Mujiono*	1.50	5.53	4.03	0.71	4.80	4.09
	Masiran*	0.98	1.96	0.99	0.66	1.57	0.91
	Ali*	0.70	5.57	4.87	0.57	4.29	3.72

	Marji	1.50	8.77	7.27	0.80	9.59	8.79
	Purnomo	1.28	5.46	4.19	0.63	7.59	6.96
	Tobiin	1.20	6.25	5.05	0.71	5.75	5.04
	udiyono	0.85	8.55	7.70	0.63	8.82	8.19
Probo-linggo	Iwan	0.80	11.11	10.31	0.84	13.89	13.05
	Sarif	1.35	11.11	9.76	0.73	16.67	15.94
	Sambang	0.88	6.00	5.13	0.70	10.80	10.10
	Nahrowi**	1.50	4.60	3.10	0.87	9.20	8.34
	Average	1.14	7.26	6.12	0.75	8.74	7.99

Note: *) these farmers put IPDM plots in lower location and shaded areas. During high rainfall, the crops were flooded, and the infestation of fusarium wilt was higher than farmers' practices. **)This IPDM farmer's plot was compared to adjacent farmer's plot. This farmer applied IPDM technology to total plot, instead of half plot.

Table 3. Percentage changes in yield and net revenue

Site	Farmers	Yield (kg)			Net revenue (IDR Million)		
		Farmers' practices	IPMD practices	% change	Farmers' practices	IPMD practices	% change
Pare	Slamet	874.29	995.71	13.9	15.31	18.00	17.56
	Misri*	160.71	96.43	-40.0	1.84	0.75	-59.38
	Mujiono*	307.14	266.67	-13.2	4.03	4.09	1.55
	Masiran*	178.57	142.86	-20.0	0.99	0.91	-8.01
	Ali*	371.43	285.71	-23.1	4.87	3.72	-23.73
	Marji	515.71	564.29	9.4	7.27	8.79	20.96
	Purnomo	321.43	446.43	38.9	4.19	6.96	66.18
	Tobiin	446.43	410.71	-8.0	5.05	5.04	-0.20
	udiyono	450.00	464.29	3.2	7.70	8.19	6.41
Probo-linggo	Iwan	444.44	555.56	25.0	10.31	13.05	26.52
	Sarif	444.44	666.67	50.0	9.76	15.94	63.27
	Sambang	333.33	600.00	80.0	5.13	10.10	97.12
	Nahrowi	200.00	400.00	100.0	3.10	8.34	168.87
	Average	5,047.94	5,895.32	**16.8**	6.12	7.99	**30.58**

Note: *) these farmers put IPDM plots in lower location and shaded areas.

In this analysis, the costs associated with rental land, seedling material (bulb), inorganic fertilisers, water irrigation and other materials are not included in calculation because such costs are the same in both IPDM and farmers' practices.

On average, the other costs are about Rp 4,920,000 per 0.1ha. The costs consist of rental land (Rp620,000), bulb of planting material (Rp2,000,000); fertilizers (Rp520,000); labour for land preparation and maintenance (Rp1,500,000), and other materials (Rp280,000). When the other costs are included in the percentage change in net revenue, the increase in net revenue is calculated to be 156%, which is very high. In reality however, in small scale farming like in Java, labour costs and rental land are not included. Labour mostly comes from family members; there is no rental land because farmers privately own the land.

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 participation[2] 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 on a maturity model[3] 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

[2] 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.

[3] http://cmmiinstitute.com/

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)

Type of partnership	**Description / Features**	**Weighting**	**Scoring rationale (1-3)**
Transformational	These partnerships are oriented for system-level changes in policy and practice. Problem definition and design of actions is shared by RI and PS partners via deliberative processes – both are equal drivers of the partnership. Partnership extends beyond projects to strategic, long term relationship. Partners have equal stake in the partnership. Activities of research institutes support adaptive management and learning.	3	Scoring (1-3) based on the extent to which the RI side of the partnership is reflecting the qualities of the type of partnership. 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. 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.
Collaborative	Influencing individuals, organisations and systems RI and PS collaborate to define problems, goals and research process. Each has distinct, active role/contribution based on relative strengths. Research institutes engage in the experiments/research questions of the private sector.	2	
Consultative	Consultation between RI and PS about problems and solutions. RI activities focus on supporting PS goals with less direct involvement of PS in driving implementation/activities. The role of research extends to surveying and diagnosis of systemic issues rather than focus on agricultural technical fix.	1	
Transactional	Partnership focuses on practical solutions to clearly defined problems	0	

Type of partnership	Description / Features	Weighting	Scoring rationale (1-3)
	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.		

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

Routines for engagement	Description	Weighting	Scoring rationale (1-3)
Optimising	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	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.
Established	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 *Piloting*. It indicates that one-off events have been incorporated into regular RI practices.	5	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
Piloting	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 *Demonstration,* in *Piloting*, 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 project" to "here is the value of our research to your business".	1	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 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.

Routines for engagement	**Description**	**Weighting**	**Scoring rationale (1-3)**
Demonstration	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 *Demonstration*, RIs have prioritised working with the private sector, however their experience in doing so as an institution (distinct from through individuals in *Ad hoc*) 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
Ad hoc	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
None	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

KPI 1a **Increased capacity of research institute intervention teams**

Intervention Team	Baseline				June 2016					
(Intervention start date)	**Type/justification**	**Weighting**	**Score**	**Total**	**Type/justification**	**Weighting**	**Score**	**Total**	**Change**	**Estimated change attributed to ARISA**
Beef - UNRAM (Sep 2015)	Transactional: Limited prior experience with the private sector, except through individual team members who are contracted for specific services.	0	-	0	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
Maize - UNRAM (Sep 2015)	Transactional: Some experience with private sector via individual contracts and project-based work. Past experience with Syngenta limited to field trials/provision of inputs.	0	-	0	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.	1	3	3	3	2

Cassava - UNJEM (Oct 2015)	Collaborative: UNJEM team collaborate closely with PT BCM. Roles are distinct, and partnership activities are driven by UNJEM.	2	3	6	Collaborative: UNJEM team collaborate closely with PT BCM. Roles are distinct, and partnership activities are driven by UNJEM. UNJEM are seeking to diversify the range of partners they are working with.	2	3	6	0	0
Sugar - ISRI (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	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
Dairy - UNBRAQ (Mar 2016)	Transactional	0	-	0	NA - too early for change			0	0	

ARISA TOTAL	**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 UNJEM; 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**	**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 UNJEM, who had deeper/more mature partnerships at the commencement of ARISA, the degree of change is less visible.**			**13**	**5**	**4**

KPI 1b **Increased capacity of research institute - routines for engagement**

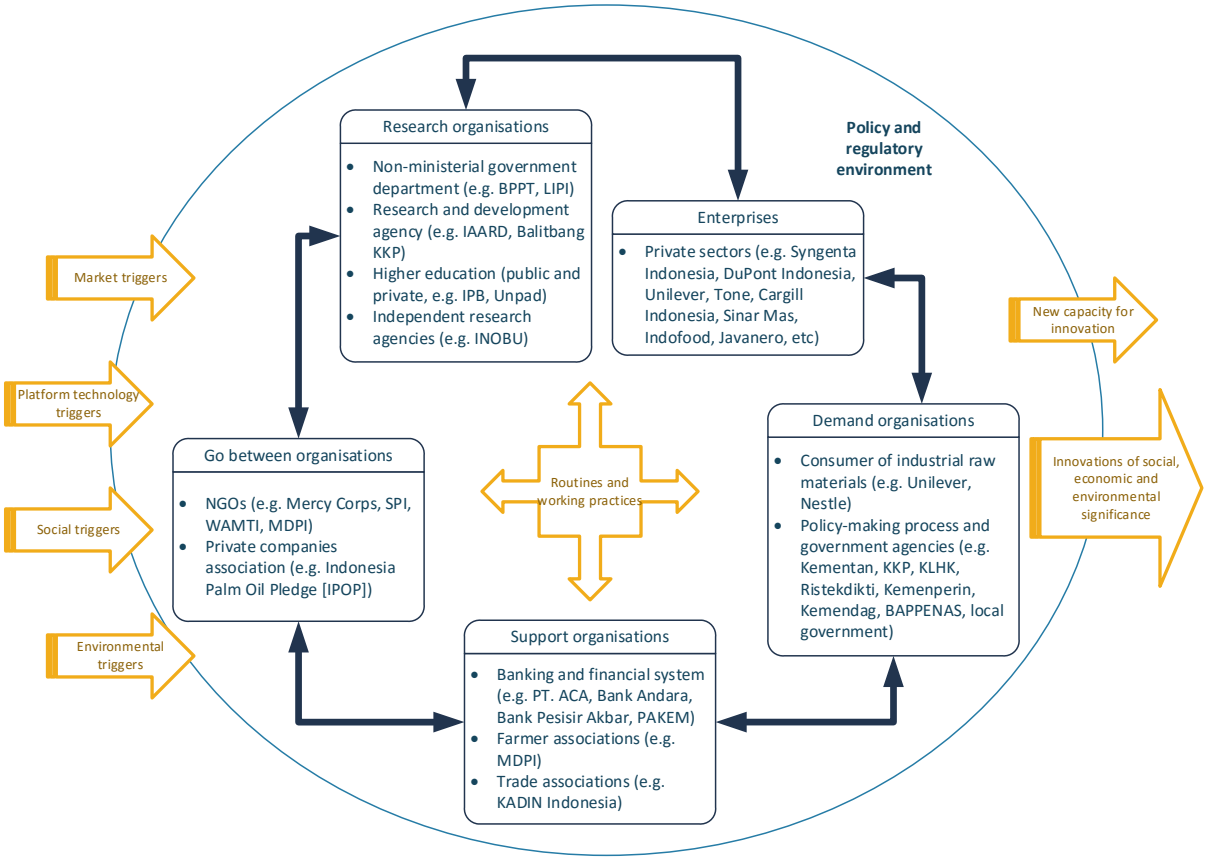
	Baseline				June 2016					
Research Institute	**Level / justification**	**Weighting**	**Score**	**Total**	**Type/justification**	**Weighting**	**Score**	**Total**	**Change**	**Estimated change attributed to ARISA**
UNJEM (cassava)	Demonstration: UNJEM is seeking ways to engage with the private sector, 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	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
UNRAM (beef and maize)	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	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
Total	**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**	**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**

Appendix 4. See separate Powerpoint file

Appendix 5: CIPG Report: Mapping Indonesian innovation landscape

Indonesian AIS Dynamics: An overview

Elements of a dynamic working system in Indonesian agriculture sector more or less can be seen in the figure below:



Source: Adapted from Hall (2012)

Line ministries

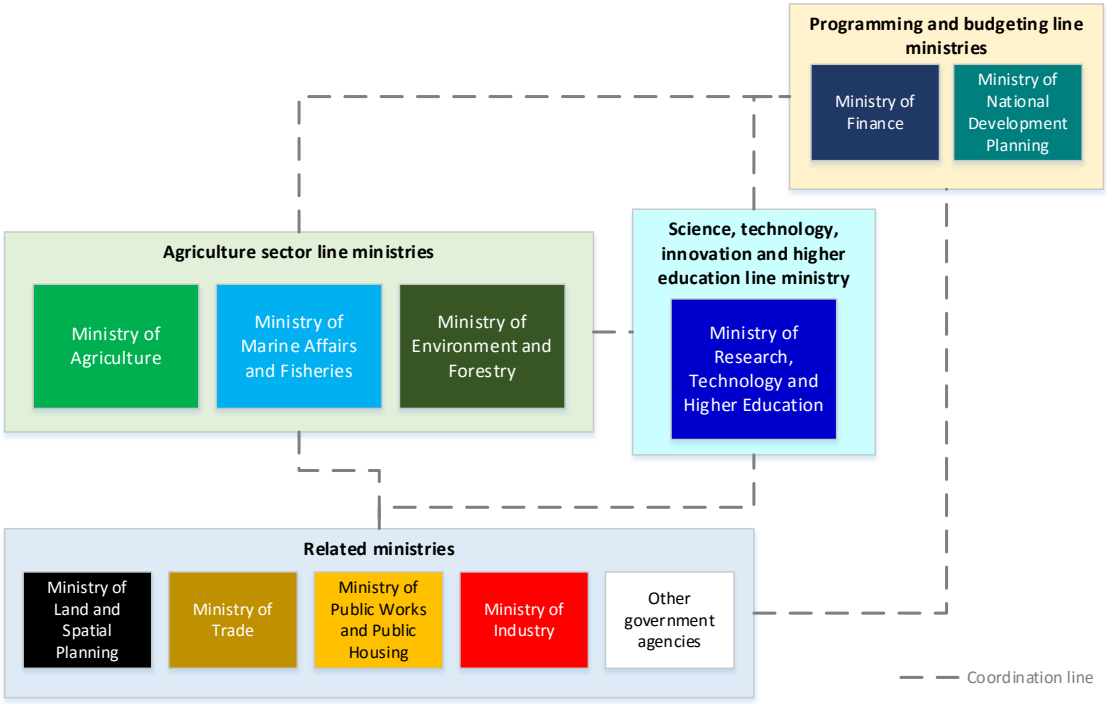
The line ministries for agriculture sector are Ministry of Agriculture (Kementan/*Kementerian Pertanian*) for crops, plantation, horticulture and livestock sub-sector, Ministry of Marine Affairs and Fisheries (KKP/*Kementerian Kelautan dan Perikanan*) for fisheries sub-sector and Ministry of Environment and Forestry (KLHK/*Kementerian Lingkungan Hidup dan Kehutanan*) for forestry sub-sector.

Kementan is used to be the sole ministry regulating agriculture sector. However, circa 1960s, the responsibility for forestry sub-sector has been moved to Ministry of Forestry (later was merged with Ministry of Environment into KLHK) and since 1999, fisheries sub-sector has been under the responsibility of KKP.

Ministry of Research, Technology and Higher Education (Ristekdikti/*Kementerian Riset, Teknologi, dan Pendidikan Tinggi*) is the line ministry for science, technology, innovation and higher education. Kementan, KKP and KLHK supervise Indonesian Agency for Agricultural Research and Development (IAARD/*Badan Penelitian dan Pengembangan Kementerian Pertanian*), Indonesian Agency for Marine Affairs and Fisheries Research and Development (Balitbang KKP/*Badan Penelitian dan Pengembangan Kelautan dan Perikanan*) and Forestry Research and Development Agency (FORDA/*Badan Litbang dan Inovasi*) respectively. In terms

of agricultural innovation, it is under coordination of Kementan, KKP, KLHK and Ristekdikti. In practice, Ristekdikti would coordinate with IAARD, Balitbang KKP and FORDA for innovation related issues.

In addition to those four ministries, coordinating ministries which have roles in agriculture, innovation and agricultural innovation development among others are: Ministry of Industry (Kemenperin/*Kementerian Perindustrian*), Ministry of Trade (Kemendag/*Kementerian Perdagangan*), Ministry of Finance (Kemenkeu/*Kementerian Keuangan*), Ministry of Public Works and Public Housing (PUPERA/*Kementerian Pekerjaan Umum dan Perumahan Rakyat*), Ministry of Land and Spatial Planning (ATR/*Kementerian Agraria dan Tata Ruang*) and Ministry of National Development Planning (BAPPENAS/*Kementerian Perencanaan Pembangunan Nasional*).



Source: Author.

There are also non-ministerial government department (NMGDs) which have roles in agricultural science, technology and innovation development, among others are: Agency for the Assessment and Application of Technology (BPPT/*Badan Pengkajian dan Penerapan Teknologi*), Indonesian Institute of Sciences (LIPI/*Lembaga Ilmu Pengetahuan Indonesia*). Both are under coordination of Ristekdikti.

Higher education

The transition into greater autonomy in higher education was started in 1998 and later in 1999. Through government regulation No. 61/1999, seven state universities gained new status. In which, four universities were given greater independence and the other three had become a model for other institutions that were set to join the group (Rakhmani & Siregar, 2016). Those seven universities are Bandung Institute of Technology (ITB/*Institut Teknologi Bandung*) in West Java, Gadjah Mada University (UGM/*Universitas Gadjah Mada*) in D.I. Yogyakarta, Bogor Institute of Agriculture (IPB/*Institut Pertanian Bogor*) in West Java, University of Indonesia (UI) in West Java, Indonesia University of Education (UPI/*Universitas Pendidikan Indonesia*) in West Java, North Sumatera University (USU/*Universitas Sumatera Utara*) in North Sumatera and Airlangga University (Unair/*Universitas Airlangga*) in East Java.

In a nutshell, this autonomous state universities scheme was updated, criticised, annulled and reformed. Now, there are three kind of state universities, specifically: conventional public universities, Public Service

Unit (BLU/*Badan Layanan Umum*) universities and autonomous state universities (PTN BH/*Perguruan Tinggi Negeri Badan Hukum*). Conventional public universities are fully regulated under the responsibility of Ristekdikti. Both BLU universities and PTN BH universities have more freedom in managing their financial. In addition to public budget (through Ristekdikti), they have the autonomy to seek other financial sources. Furthermore, PTN BH universities also have the autonomy to manage their academic affairs.

Autonomy to manage:	Conventional Public Universities	BLU Universities	PTN BH Universities
Academic	No	No	Yes
Non-academic (such as financial)	No	Yes	Yes

Now, there are 12 PTN BH universities. In addition to seven universities stated above, there are Diponegoro University (Undip/*Universitas Diponegoro*) in Central Java, Padjadjaran University (Unpad/*Universitas Padjadjaran*) in West Java, Sepuluh Nopember Institute of Technology (ITS/*Institut Teknologi Sepuluh Nopember*) in East Java and Hasanuddin University (Unhas/(Universitas Hasanuddin) in South Sulawesi.

For agricultural research and education, the prominent universities, to name a few, are: IPB, Unpad, UGM, Undip, Unair, ITB (technology for agriculture in general) and ITS (particularly for fisheries sub-sector), Unhas. Other prevalent state universities in agriculture sector are: Sebelas Maret State University in Central Java, Jember University in East Java, Riau University in Riau, Haluoleo University in South East Sulawesi and Tadulako University in Central Sulawesi.

To some extent, Ristekdikti still has limited roles in academics and non-academics in PTN BH universities. For instance, through research incentives such as Research Incentives for National Innovation System (InSINas/*Insentif Riset Sistem Inovasi Nasional*). In 2015, there were 35 universities (public and private) included in consortium funded by InSINas.

Policy directive/thrust

In the long term, Indonesian policy directive for agriculture is food sovereignty. For 2015-2019, government has focused on food security. Policies to reach food security are:

- Increasing productivity of main agriculture commodities
- Maintaining foodstuff price stability
- Improving the quality of food and nutrient consumption
- Mitigation for food security disturbance
- Increasing the welfare of agriculture actors mainly smallholders

Government, through Kementan, has supervised seven commodities. The commodities are rice, corn, soybean, sugar, shallot, beef meat and chilli. KKP supervises four commodities, namely: shrimp, tuna, mackerel tuna and skipjack tuna. KLHK supervises timber and rattan commodities.

Policy schemes and instruments

This table summarised the agricultural schemes provided by Indonesian government. There are at least five ministries that have major influence in Indonesian agriculture: Ministry of Agriculture (Kementan), Ministry of Marine Affairs and Fisheries (KKP), Ministry of Research, Technology and Higher Education (Ristekdikti), Ministry of Industry (Kemenperin), and Ministry of Trade (Kemendag).

No	Schemes	Instruments	Agriculture	KKP	Ristekdikti	Industry	Trade
1	Capacity building	Training, extension, mentoring	v	v	v	v	v
2	Partnership	Consortium, MoU, MRA, collaboration	v	v	v	v	v
3	Access to finance	Credit, investment, access to capital	v	v	v	v	v
4	Fiscal policy	Tax	-	-	-	v	v
5	Non-fiscal policy	Subsidy	v	-	-	-	v
6	Risk management	Insurance	v	v	-	-	v
7	R&D	Product development, research	v	v	v	v	v
8	Certification/standardisation	Assistance on certification/ standardisation process	v	v	v	v	v
9	Infrastructure	Machinery, laboratory	v	v	v	v	v
10	Facilitation	Regulation assistance, access to other stakeholders, bureaucracy	v	v	v	v	v
11	Technology support	ICT utilisation, information system, monitoring system	v	v	v	v	v
12	Promotion		v	v	v	v	v
13	Data and information		v	v	-	-	v
14	Innovation support	Technology transfer, innovation cluster, business incubation	v	v	v	v	v

Note: MA&F (Marine Affairs and Fisheries); RT&HE (Research, Technology and Higher Education)

- **Capacity building** is the most common scheme provided by the government. The instruments vary from training to mentoring either for extension workers, farmers, fishermen, community, or business units.
- **Certification/standardisation** and **facilitation** are other common schemes provided by the government. These processes are often accompanied with capacity building for the stakeholders involved.
- All five ministries provide **access to finance,** including credit or investment for farmers, fishermen, fish farmers, SMEs, and large-scale industries.
- Only the Ministry of Trade and the Ministry of Industry have **fiscal policy**. For example, tax holiday for investment in related government's programmes.
- The Ministry of Trade and the Ministry of Agriculture provide **non-fiscal policy**, particularly using subsidy as the instrument. For example, Ministry of Trade gives subsidy for exporters who were able to market their products in a new country.
- Based on its 2015 national budget, Indonesia had a total of Rp 414.7 trillion subsidy. Only 17% of it (Rp 70 trillion) was allocated for non-energy subsidy. From that number, 79.28% alone (equal to Rp

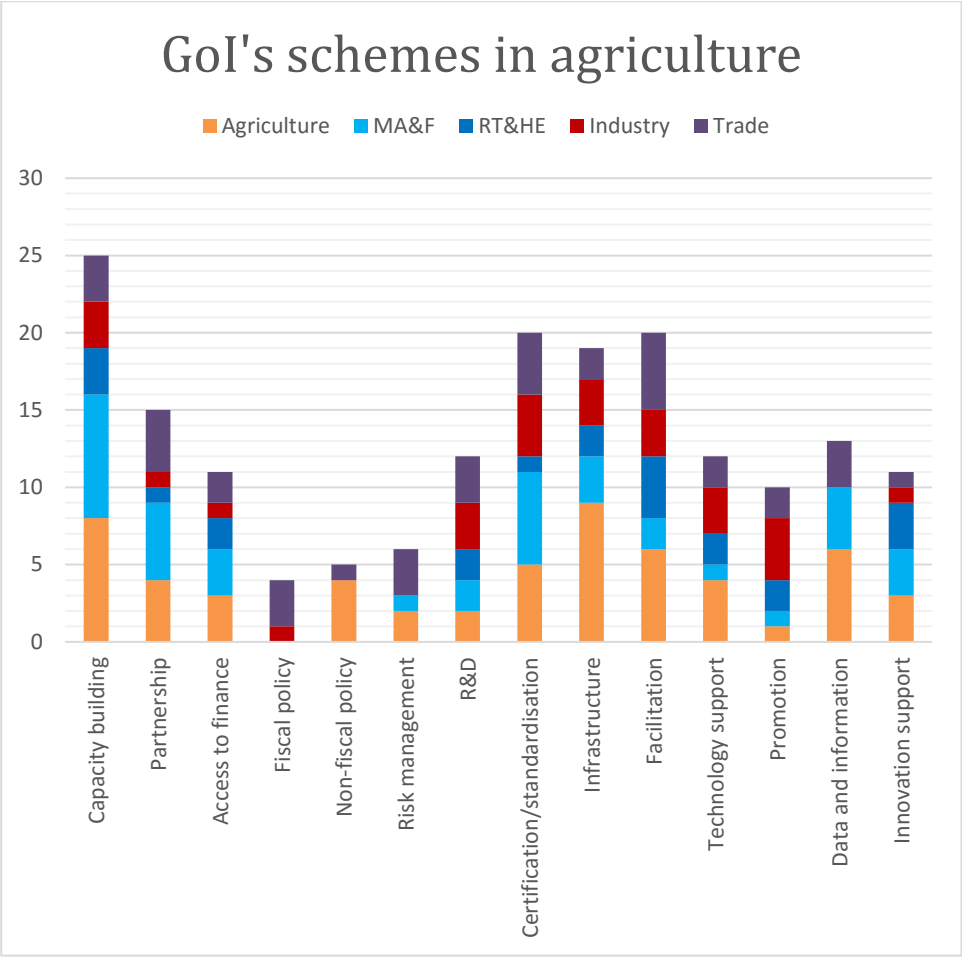
55.5 trillion) was for agricultural related subsidy, including fertilizer and seeds subsidy for farmers and rice subsidy for poor household.[4]

- **Insurance** is provided by the Ministry of Agriculture, the Ministry of Marine Affairs and Fisheries, and the Ministry of Trade as part of risk management. Ministry of Agriculture has recently issued a new policy on crop failure insurance. While Ministry of Marine Affairs and Fisheries is expected to launch an insurance scheme for fishermen by 2016.
- Most of the **infrastructures** are provided by the Ministry of Agriculture. These include tertiary irrigation, post-harvest machinery and on-farm equipment.
- **Innovation support** is usually provided by the ministry R & D agency. The Ministry of Agriculture has its own technology transfer office (BPATP/*Badan Pengelola Alih Teknologi Pertanian)* which is responsible for commercialising R & D products. Meanwhile, the Ministry of Marine Affairs and Fisheries provides technical support on innovation and technology transfer through its R & D agency.

Note on data and information:

It seems that data and information is an issue here. Almost all ministries, except the Ministry of Industry, have specific programme regarding data and information consolidation. For example, since 2013 the Ministry of Trade has developed Enterprises' Online Information System (SIPO/*Sistem Informasi Perusahaan Online*) to collect all data from regional office to be stored in its central database. Meanwhile, the Ministry of Marine Affairs and Fisheries has a programme for data and information consolidation (include map of protected and prohibited biodiversity agent, diseases, marine bio toxin, hazardous materials) and integrated data and information on marine spatial planning

[4] For Indonesia 2015 national budget in brief, see http://www.anggaran.depkeu.go.id/dja/acontent/bibfin.pdf



Review on GoI's schemes and instruments

In the elements of a dynamic agricultural working system, INSINAS works as a go-between organisation operated under the Ministry of Research, Technology and Higher Education. It gives a grant scheme for basic and applied research which prioritised seven research subjects: food security, energy, transportation, ICT, defence, health and medicine, and advanced materials. There are two mechanisms to apply for the scheme via consortium and non-consortium. Both of the mechanisms last up to three years of agreement. In 2015, there were 46 organisations as grantee. They produced 272 researches, 151 (55.51%) are agricultural related researches. This programme supported by Research, Technology and Higher Education Ministerial Regulation and Ministerial Decree.

While INSINAS works in a policy and regulatory environment, there is a Technology Business Incubation Centre (TBIC) which helps incubating technology and products developed by partners. TBIC was run under the administration of Centre for Science and Technology Research (Puspiptek), still a research organisation under the Ministry of Research, Technology and Higher Education. Currently there are 20 tenants from 5 different partners. In 2014, one of the enabling factors to develop TBIC was Research, Technology and Higher Education Ministerial Decree No. 20/M/Kp/IV/2014 on Revitalization of Centre for Science and Technology Research and Development of Indonesia Science Techno Park. Based on the elements of a dynamic working system, TBIC works both as a market triggers and platform technology triggers. TBIC aims to increase technological start-ups from Puspiptek and other R&D organisations. TBIC conducts in-wall and co-incubation so that it allows TBIC to works closely with its partners and allotted more resources on capacity building and market development. Furthermore, TBIC will provide product incubation run by Indonesia Life Science Centre.

Currently, another programme which gain wide support from several ministries and government agencies is the establishment of Science and Techno Park (STP). Based on Nawacita (Nine Priority Agenda) in Science and Technological Innovation, STP is an area that is professionally managed, aims to improve the welfare of its members through the creation and enhancement of ecosystems that support innovation to improve the competitiveness of the industries and institutions it supports. There are currently seven ministries and government agencies received funding for STP programme. They are Ministry of Research, Technology and Higher Education, Ministry of Agriculture, Ministry of Marine Affairs and Fisheries, Ministry of Industry, Agency for Assessment and Application of Technology (BPPT), Indonesia Institute of Science (LIPI), National Nuclear Agency (BATAN).

In the Ministry of Research, Technology and Higher Education STP has been implemented by Director of Science and Technology and Other Supporting Institutions. Their working definition of STP is adapted from the International Association of Science Parks (IASP). An area that is managed by professional management to encourage sustainable economic growth through mastery, development, and implementation of relevant science and technology. By 2019, the ministry aims to establish 100 STPs and going to have 58 mature STPs.

The implementation of Techno Park has also been a concern for the Ministry of Agriculture. They have been attempting to develop Agro Science Park (ASP) and Agro Techno Park (ATP) since 2015. Each of ATPs and ASPs have their own main commodities to be developed. Currently there are five ASPs in Sumatra (1), Java (1), Sulawesi (2) and Kalimantan (1) islands and sixteen ATPs in Java (7), Sumatra (3), Kalimantan (3), Sulawesi (2), and Nusa Tenggara (1) islands. The ASP and ATP programme has been implemented under the Agricultural Research Centre (BBIA) which obtain an additional ceiling funding of IDR 5 Billion.

There has been lots of challenges of putting STP/ATP/ASP concepts into practices. First thing, there are different understandings among stakeholders of STP/ATP/ASP. Second, some of the existing STPs do not have master plan, thus it is not optimally functioned. Third, there has been a delay in disbursement of fund which hindering coordination to implement the programme. At the current situation, it later worsened by the budget cut for this state funding.[5] Another challenge come from a lack of monitoring and evaluation mechanism for STPs maturity assessment since this has been a new programme. Last but not least, there is yet a commercialisation of research outputs/products in a high-level products. The current product development in existing STPs are undertaken without any market intelligence and there are only weak connections with the industry/business as well. Here it can be concluded that there are missing stages in the routines and working practices where the enterprises and markets have oftentimes been engaged only at the end of the product development process.

Due to current economic situations where there is a deeper trade balance deficit between the value of exports and imports, the President launched Ten Economic Policy Package, one of them is National Interest Account (NIA).

NIA is a programme to strengthen export financing intended for transaction/project that is commercially difficult to implement but is considered necessary by the government. This programme involves Coordinating Ministry of Economic Affairs, Ministry of Trade, Ministry of Finance, Ministry of Cooperatives and SMEs, and Ministry of Industry. This program has officially been acknowledged under the Law 2/2009 (UU) and implemented by Indonesia Eximbank (LPEI). It also has Export Oriented People's Business Credit (KURBE) mainly for SMEs export-oriented and other export supporting agency.

Under the Ministry of Trade, NIA has been a stimulus to increase diversification of export markets and products which ultimately are the goals of Directorate General of National Export Development (Dirjen PEN). The incentives for private sectors are the Primaniyarta Award which will be given to the most

[5] Kompas, 15 June 2016, "Pemotongan Perlambat Hilirisasi"

outstanding exporters in the field of exports and the award recipient will receive a special export financing scheme from Indonesia Eximbank and Standard Chartered Bank (include: export capital financing, investment, guarantees, insurance, and trade finance facilities). Within a period of 5 consecutive years there are 6 companies receiving the award: PT. Bio Farma, PT. Growth Asia, PT. Indesso Aroma, PT. Megasurya Mas, PT. Musim Mas, and PT. Smart Tbk.

For the official, the incentives are given in a form of Balanced Scorecard which have been implemented since 2007. It is a tool for measuring the performance through a system of planning, monitoring, evaluation of the implementation of policies, programmes, and achievement. In order to be effective, NIA should ideally meet the following criteria:
(I) shall be decided collegially by several ministries / agencies;
(Ii) cannot be financed on commercial (high risk); (Iii) have a long-term export development prospects; (Iv) boost value added and competitiveness of Indonesian products, (v) set specific and measurable (clearly define); and (vi) is carried out within a certain time period (limited). Here it can be concluded that this programme have been implemented to put the missing link in the routines and working practices mainly to involve more enterprises and attract new market/consumers.

As the main support organisation for the agricultural development is certainly the Ministry of Agriculture. The fact that this institution may provide supports mainly in the development of vegetation phase, the Ministry of Agriculture have a programme called Horticulture Agribusiness Area Development (PKAH). It is implemented by the Indonesian Agency for Agricultural Research and Development (Balitbangtan) specifically under the Horticulture Research and Development Centre. This program has been implemented since 2010 as one of the strategic programmes of Ministry of Agriculture. The PKAH locations were selected based on market size, competitive advantages, economic value, production area distribution, and agro ecology suitability. For a period of 2010-2013 there has been 18 horticulture area in 9 regencies. Its best practices was implemented in East Java.

The main programme of PKAH is to give assistance to farmers' group (GAPOKTAN) including technological and institutional assistance. Technological assistance are: Seeds and Cultivation Technology, Off Season Technology, New Seeds Varieties, Pest Control, Fertilisation, GAP application, and others. Meanwhile, institutional assistance include: cultivation, marketing, processing, and production.

No	
Cases	Research incentives for national innovation system (InSINas/*Insentif Riset Sistem Inovasi Nasional*)
Line ministry	Ministry of Research, Technology and Higher Education
Working unit	Directorate General of Research and Development Advancement
Focal point	
Period	2012-present
Programmes and incentives	Research Incentive for Nasional Innovation System (InSINas*/Insentif Riset Sistem Inovasi Nasional*): grant for basic and applied research through consortiums and non-consortiums which involve R&D organisations, higher education institutions, and business sector. InSINas is prioritised for 7 subjects: ▪ food security, ▪ energy, ▪ transportation, ▪ ICT,

- defense,
- health and medicine, and
- advanced materials.

Mechanism:

- Consortium: partnership of at least 3 institution: research and development agency (R&D), higher education (HE) and industry
- Non-consortium: at least 3 researchers from at least one research organisation

No	Scheme	Type of research	Period	Type of grantee	Partnership
1	Non-consortium	Basic/applied	1-3 years	R&D, HE, industry	Not required
2	Consortium	Basic/applied	1-3 years	R&D	At least 2 partners: HE & industry
				Industry	At least 2 partners: R&D & HE
				HE	At least 2 partners: R&D & Industry

InSINas 2015:

- Total fund provided: Rp 77.25 billion, Rp 36.825 billion are for agricultural research.
- 151 out of 272 researches (55.51%) being funded are related to agriculture.
- There are 46 organisations received InSINas for agricultural research:
    a. 3 business sector: all from PT RPN three different research centres
    b. 35 higher educations: Bogor Agricultural Institute, Bandung Technological Institute, Surabaya "10 Nopember" Institute of Technology, State Polytechnic of Jember, Payakumbuh Agricultural Polytechnic, STKIP PGRI of West Sumatera, Airlangga University, Andalas University, Brawijaya University, "Bung Hatta" University, Diponegoro University, Gadjah Mada University, Halu Oleo University, Hasanuddin University, University of Indonesia, Jember University, Soedirman University, Khairun University, Lambung Mangkurat University, Lampung University, Ma Chung University, Merdeka Madiun University, University of Muhammadiyah Malang, University of Muhammadiyah Purwokerto, Mulawarman University, State University of Papua, Padjadjaran University, Riau University, "11 Maret" State University, Sriwijaya University, Syiah Kuala University, Tadulako University, Tanjungpura University
    c. 4 R & D: BPPT Engineering, BATAN, LIPI - Biotechnology, LIPI - Chemistry
    d. 7 government R & D, including Agency for Agricultural Research and Development – Ministry of Agriculture , Agency for Marine and Fisheries Research and Development – Ministry of Marine Affairs and Fisheries, Centre for Material and Technical Product – Ministry of Industry

	▪ Out of 151 agricultural researches funded by InSINas, there are only 9 research consortiums (BPPT Engineering: 3 researches, LIPI: 1 research, PT RPN: 1 research, IPB: 1 research, ITB: 1 research, UGM: 1 research, Ma Chung University: 1 research).
Enabling factors	▪ Research, Technology and Higher Education Regulation No. 14/2015 on National Standard for Higher Education, Guidance and Implementation of Industrial Technology Development ▪ Research, Technology and Higher Education Decree No. 498/M/Kp/VIII/2015 on The Establishment of Research Incentives National System Innovation Programme
Challenges	▪ Mapping on public technological need as well as industrial technological need is not available. ▪ There is no national integrated database on research and development. ▪ State budget structure.
Impact	▪
Engagement strategy	
Other engagement	
Sources	▪ http://www.unp.ac.id/sites/default/files/Panduan_insinas_2015.pdf ▪ https://insentif.ristek.go.id/_assets/docs/insinas_repo_1441095386.pdf

No	
Cases	Technology Business Incubation (IBT/*Inkubasi Bisnis Teknologi*) Year 2016
Line ministry	Ministry of Research, Technology and Higher Education
Working unit	Directorat Generale of Innovation Strenghthening
Focal point	Directorat of Technology-Based Start-up Company (*Direktorat Perusahaan Pemula Berbasis Teknologi*)
Partnership	Business incubators
Period	Since 2016
Programmes and incentives	<u>Objectives:</u> ▪ To increase commercialisation of Indonesia's research and development outputs ▪ Boosting technology-based startup companies ▪ Supporting technology-based business incubator in developing new small and medium enterprises <u>Expected outcomes:</u> 25 startups assisted by selected business incubators <u>Focus area:</u> 1. Food 2. Health and medicine 3. Energy 4. Transportation 5. Defence and security 6. Information and communication technology 7. Advanced material

	8. Maritime Services: 1. Business infrastructure (office, internet, meeting spaces, telecommunication infrastructure, office supplies) 2. Business development services (consultation and training, business plan development and feasibility studies, business legals assistance, product standardisation, product certification, intellectual property rights, human resource development, business mentoring, product testing, business management, market research and testing, promotion) 3. Fund raising (access to capital from banking and non-banking institution, access to capital from government agencies) 4. Networking and business collaboration (regular business meetups, collaboration with R&D agencies and technology transfer offices, business partnership with private sectors, exhibition and promotion) Period of incubation: 2 years Progress per June 2016: If on schedule, selected startup companies has been announced and the incubation program has just started.
Enabling factors	N/A
Challenges	This programme has just started
Engagement strategy	N/A
Other engagement	N/A
Impact	There are no measurable impact yet
Sources	http://ristekdikti.go.id/pengumuman-program-insentif-inkubasi-bisnis-teknologi-ibt-2016/

No	
Cases	Incentive for technology applied in industry (*Program Insentif Teknologi yang Dimanfaatkan di Industri*)
Line ministry	Ministry of Research, Technology and Higher Education
Working unit	Directorat Generale of Innovation Strenghthening
Focal point	Directorat of Industry Innovation
Partnership	Between industry and government R&D agencies (required by the programme)
Period	Since 2016
Programmes and incentives	Eligible grantee: Industry or private sectors who has R&D collaboration with government agencies/universities/other industry in R&D. This R&D collaboration must achieve prototyping phase. Focus area:

	1. Food 2. Health and medicine 3. Energy 4. Transportation 5. Defence and security 6. Information and communication technology 7. Advanced material <u>Incentives will cover funding for:</u> Testing cost in production scale, standardisation, certification, technology transfer process, registration, technology audit, production permits and other activities related to trial production for the technology. For Batch I 2016, there are 16 companies/industries receiving this incentive. There is one grantee related to agriculture, that is: CV. Gemilang Karya Sentosa for seeds production technology development. The amount of funded: IDR 293,400,000. Currently (per June 2016), Batch II is ongoing process and the grantee will be announced at 1 July 2016.
Enabling factors	N/A
Challenges	This programme has just started
Engagement strategy	N/A
Other engagement	N/A
Impact	There are no measurable impact yet
Sources	http://ristekdikti.go.id/pengumuman-sk-pemenang-insentif-batch-i/

No	
Cases	Business incubation
Line ministry	▪ TBIC (Technology Business Incubation Center) Centre for Science and Technology Research (Puspiptek/*Pusat Penelitian Ilmu Pengetahuan dan Teknologi*) under the coordination of Ministry of Research, Technology and Higher Education ▪ Ministry of Industry
Working unit	TBIC (Technology Business Incubation Center) Puspiptek Directorate General of Small and Medium Industry, Ministry of Industry
Focal point	▪
Period	2015 (October)-present
Programmes and incentives	Puspiptek operates a total of 49 laboratories, and communicate closely with Indonesian Institute of Science (LIPI), Agency for Assessment and Implementation of Technology (BPPT), National Nuclear Energy Agency (BATAN), and two different ministries: Ministry of Research, Technology, and Higher Education and Ministry of Environment and Forestry.

Puspiptek currently provides two schemes of incubation:

1. Technological business incubation aims to increase technological start-ups from Puspiptek research centres and other R & D organisations. Since TBIC conducts in-wall and co-incubation, it prefer partners who are physically near to TBIC office in Serpong. Co-incubation model allows TBIC to work closely with its partner and allocate more resources on capacity building and market development.
2. Product incubation which will soon be initiated by Indonesia Life Science Centre (ILSC). Product incubation are for consortiums involving R & D organisations and industry, as industrial qualified laboratories are needed for life science development to meet industrial criteria. PT Biofarma has agreed to join research consortium for vaccine.

TBIC now has 20 tenants from 5 different partners. Each tenant has their product.

No.	Co-incubation Partner	Tenant	Description
1.	incuBie (IPB incubator unit)	Domiqado	Web-based gifts shop for crafts and digital products.
2.		Webkece	Cloud-based website designing service.
3.		Ke'if SB	Technological innovation for industrial scale kefir production.
4.		*Pawon Selera*	High pressure processing and active packaging for ready-to-serve food.
5.		PalaBoo Madu	Bogor special beverage made from nutmeg and honey.
6.		Mangano	Indonesian traditional food in ready-to-serve package.
7.	LIPI Technology Incubator	DNR International	Zirconia for high-temperature ceramic materials.
8.		Mulia Graha Estetika	Vertical board for growing plants.
9.		CV Media Sarana Usaha	Nanotechnology application.
10.		FiLa (*Fisika Laboratoria)*	High energy ball mill for nano particle production.
11.	Business and Technology Innovation Centre) MITI (*Masyarakat Ilmuwan dan Teknolog Indonesia*)	CNDTPI (Centre for Non-Destructive Testing and Process Imaging)	eCVT (electronic continuously variable transmission) system for industrial process imaging-laboratory scale.
12.		CEST (Centre for ELEctronic Science and Technology)	Measurement and data acquisition system for electrical tomography.
13.		CIPD (Centre for Innovation and Product Development)	Electro Capacitive Cancer Treatment (ECCT).
14.		Alzyme	Technology for genetic sex determination of the date palm seeds.
15.	BPPT Technology Incubator Centre	Grasindo	Commercialisation for eugenol derivatives.
16.		Nahecho	Online marketing for natural herbal cloth marketplace improvement (along with direct shop).
17.		Nanotech Herbal Indonesia	Nano chitosan as natural material for wound-healing and cosmetics

	18.	ITI Incubator	Alien Lox	Bluetooth and Android-based motor-lock control.
	19.		*Jamur Sehat Sejahtera*	Mushroom (*Volvariella volvacea*) cultivation using light-steel greenhouse.
	20.		PLC Micro	PLC Micro for robotic education.
Enabling factors	▪ Puspiptek often collaborate with TBIC co-incubation partners. ▪ Research, Technology and Higher Education Ministerial Decree No. 20/M/Kp/IV/2014 on Revitalization of Centre for Science and Technology Research and Development of Indonesia Science Techno Park			
Challenges	Limited resources and budget.			
Impact				
Engagement strategy	▪ Cooperate with Chamber of Commerce and Industry (KADIN/*Kamar Dagang dan Industri)* for technological marketing and networking with the industries. ▪ TBIC works with the local government (South Tangerang Regency and Bogor Regency) conducting capacity building for community nearby and designing innovation centre in South Tangerang. ▪ TBIC has started to engage with Ministry of Rural Development and Transmigration to encourage technology commercialisation in local areas.			
Other engagement				
Sources	▪			

No	
Cases	Science and techno park
Line ministry	▪ Ministry of Agriculture ▪ Ministry of Marine Affairs and Fisheries ▪ Ministry of Research, Technology and Higher Education ▪ Ministry of Industry
Working unit	▪ Indonesian Agency for Agricultural Research and Development (IAARD) – Ministry of Agriculture ▪ Agency for Human Resource Development on Marine and Fisheries – Ministry of Marine Affairs and Fisheries ▪ Directorate General of Research, Technology, and Higher Education Institutional - Ministry of Research, Technology and Higher Education
Focal point	Director of Science and Technology Areas and Other Supporting Facilities (*Direktur Kawasan Sains dan Teknologi dan Lembaga Penunjang Lainnya)* - Ministry of Research, Technology and Higher Education
Period	
Programmes and incentives	By 2019: ▪ Establish 100 Science and Technology Parks (STPs) ▪ Have 58 mature STPs Scheme for STPs:

- Facilitate capacity building and training on STPs function
- Facilitate STPs' master plan design

Agricultural Research Centre (BBIA) obtain an additional ceiling funding of IDR 5 Billion for the development of ATPs and ASPs.

No.	STP's Name/ Province	Focus	Partner(s)	Progress (by May 2016)
1	Pelalawan Technopolitan/ Riau	Agriculture/ palm oil processing, more sector will be covered in the future	Regional technical execution unit (UPTD), BPTP, LIPI, Ministry of Environment and Forestry, 24 palm oil companies. *Currently, there is no partner focussing in palm oil processing.	Width: more than3700 hectares. Has been built since 2012, this technopolitan is planned to undergo 15 years of development to be green technopolitan. Physical development such as roads and infrastructures for higher education and research area.
2	Pekalongan Fisheries Techno Park/ Central Java	Small-medium aquaculture, fisheries canning	Pekalongan municipality, Marine and Fisheries Regional Office, Soegijapranata Catholic University,	Width: around 5 hectares (3 ha for the fishpond, 2 hafor management area). This techno park incorporates IMTA (*Integrated Multi-Tropic Aquaculture* as part of the attempt to control environmental damage, since Pekalongan has been suffered from high residue of artificial dye from batik industries.). Research on microbes for environment rehabilitation and fish feed will be developed later. Under BPPT ad-hoc supervisory team, this techno park is targeted to be fully functioned within 3 years (in 2019).
3	Cimahi Techno Park/ West Java	Food and digital creative industries		This techno park will focus on 4 clusters of creative industries: food processing, fashion, craft, and animation. Later, its service will be combined with the capacity building for SMEs, particularly for technological start up.
4	Central Lampung Techno Park/ Lampung	Food/fisheries		
5	Grobogan Techno Park/ Central Java	Food/agriculture		
6	Baron Techno Park/ Yogyakarta	Energy, agro-tourism and education		
7	Bantaeng Techno Park/ South Sulawesi	Seed		

8	Penajam Paser Utara National Science and Techno Park/ East Kalimantan	Maritime		
9	Science & Techno Park BIT – Puspiptek/ Banten	Technology		

List of Agro Science Park

Location	Main Commodity
Natar PP, South Lampung, Lampung	Rice, Corn, Soybean, Cocoa, Cow, Fowl, Chilli
Jakenan PP, Pati, Central Java	Rice, Corn, Soybean, Cane, Cow
Sidondo PP, Sigi, Central Sulawesi	Rice, Cocoa, Cow, Shallot
Banjarbaru PP, South Kalimantan	Rice, Corn, Soybean, Cow
Maros PP, Maros Regency, South Sulawesi	Rice, Corn, Soybean, Chilli, Cow

PP: Pilot Plantation

List of Agro Techno Park

Name of ATP	Regency/City/Province	Main Commodity
ATP Jantho City	Aceh Besar Regency, Aceh	Rice, Soybean, Vegetable
ATP Guguak	Lima Puluh Kota Regency, West Sumatra	Sweet Potato, Orange, Cow
ATP Tanjung Lago	Banyuasin Regency, South Sumatra	Rice, Corn, Soybean, Vegetable, Livestock
ATP Cigombong	Bogor Regency, West Java	Agriculture and Livestock
ATP Cikajang	Garut Regency, West Java	Rice, Corn, Soybean, Garut Sheep
ATP Sedong	Cirebon Regency, West Java	Rice, Tropical Fruit, Goat/Sheep
ATP Lebaksiu	Tegal Regency, Central Java	Rice, Corn, Cow
ATP Nglanggeran	Gunung Kidul Regency, DI Yogyakarta	Rice, Corn, Ornamental Plants, Goat
ATP Pringkuku	Pacitan Regency, East Java	Rice, Chilli, Orange, Beef Cattle
ATP Solokuro	Lamongan Regency, East Java	Rice, Corn, Shallot, Goat, Cow
ATP South Tapin	Tapin Regency, South Kalimantan	Rice, Corn, Soybean, Horticulture, Fowl
ATP Pelaihari	Tanah Laut Regency, South Kalimantan	Rice, Corn, Rubber, Palm Oil, Vegetable
ATP Garing Hatampung	Palangkaraya City, Central Kalimantan	Horticulture, Plantation, Livestock
ATP Batui	Banggai Regency, Central Sulawesi	Rice, Cocoa, Cow
ATP Barebbo	Bone Regency, South Sulawesi	Rice, Cocoa, Cow
ATP Mollo	South Timor Tengah Regency, East Nusa Tenggara	Corn, Cow, Horticulture

Enabling factors	STPs programme is part of national development agenda
Challenges	STPs: ▪ Different understandings among stakeholders about STPs

	▪ Several existing STPs do not have master plan. Thus, they are not optimally functioned. ▪ Late disbursement fund for STPs has hinder smooth coordination between central and local government. ▪ There is no monitoring and evaluation mechanism for STPs maturity assessment. ▪ Budget cuts[6]
Impact	
Engagement strategy	Engage with local government bodies, local universities and research organisations as well as local business sector where the STPs are established. Science Park in West Papua-Manokwari focuses on sago and wood: ▪ West Papua Regional Development Plan Agency (Bappeda) ▪ Papua University (UNIPA) ▪ West Papua Regional Government Agencies ▪ Masyarakat Sagu Indonesia ▪ Agency for Assessment and Application of Technology (BPPT/Badan Pengkajian dan Penerapan Teknologi) ▪ Perum Perhutani ▪ Pendidikan Industri Kayu (PIKA) Semarang ▪ Research and Development Agency, Ministry of Environment and Forestry ▪ Gadjah Mada University (UGM) ▪ Chamber of Commerce and Industry (KADIN) ▪ Sago Exellent Science Centre (PUI Sagu) Science Park in North Kalimantan-Tarakan focuses on farming and livestock: ▪ Borneo Tarakan University (UBT) ▪ Tarakan municipality Solo Techno Park in Central Java focuses on manufacture: ▪ ATMI Solo ▪ Surakarta municipality ▪ BappSurakarta Regional Development Plan Agency (Bappeda) ▪ Symbion Techno Park (Denmark) ▪ Ideon Techno Park (Lund-Swedia) Sragen Techno Park in Central Java: ▪ Sragen municipality Agro Techno Park in Perabumulih, South Sumatera focuses to be national and regional technology transfer and agriculture pilot model (cow livestock): ▪ PT Karya Anugrah Rumpin (PT KAR) ▪ South Sumatera municipality

[6] Kompas 15 June 2016, "*Pemotongan Perlambat Hilirisasi*".

	Kaur Techno Park in Bengkulu focuses on mocaf (modified cassava flour) and coffee: ▪ Bandung Techno Park ▪ Kaur municipality ▪ Bengkulu University ▪ CV Citra Cipta Consultant Sumbawa Techno Park in West Nusa Tenggara focuses on food and mining: ▪ Sumbawa University of Technology (UTS) ▪ Sumbawa municipality Riau Science and Techno Park focuses on energy and food (fisheries and microalgae, coconut, sago, pineapple): ▪ Kampar regency ▪ Bandung Techno Park ▪ Sumbawa Techno Park ▪ Riau University Maritime Science Technology Park (MTSP) in Jepara, Central Java: ▪ Research and Development on Brackish Water Agency (BBPBAP/*Balai Besar Pengembangan Budidaya Air Payau*) under the Ministry of Marine Affairs and Fisheries ▪ Marine Affairs and Fisheries Agency of Central Java ▪ Coastal Fisheries Port (Pelabuhan Perikanan Pantai) Karimunjawa ▪ Marine Station at Awur Bay ▪ Diponegoro University (Undip) ▪ R&D Agency of Central Java ▪ Bandung Techno Park
Other engagement	
Sources	▪ Ministry of Research, Technology, and Higher Education Strategic Plan 2015-2019 ▪ Ministry of Research, Technology, and Higher Education Accountability and Performance Report 2015

No	
Case	National Interest Account
Line Ministry	Coordinating Ministry of Economic Affairs Ministry of Trade Ministry of Industry Ministry of Cooperatives and SMEs Ministry of Finance
Working unit	Directorate General of National Export Development (DGNED/Dirjen PEN-Ministry of Trade) Fiscal Policy Agency (Ministry of Finance) Directorate General of Agro Industry (Ministry of Industry)

	Deputy of Finance (Ministry of Cooperatives an SMEs)
Focal point	Nus Nuzulia/ Directorate General of National Export Development- Ministry of Trade
Duration	2009 (based on Law) 2015 (based on Economic Policy Package Phase I of September 2015)
Programmes	National Interest Account (NIA) NIA is a programme to strengthen export financing. This programme has become one of ten Economic Policy Package Phase I of September 2015 that officially launched by the President Joko Widodo. NIA is a government policy that is non-viable commercially, but is considered necessary by the government. Through this programme, the government sets a specific transaction project to increase exports which is a cross-sectoral strategic policy of several related Ministries/Institutions (K/L). NIA is a flagship project which gives a stimulus to the national export programme, taking into account the core competitiveness, the economic multiplier effect and channeling leading Indonesian products in the export market. This programme involves Coordinating Ministry of Economic Affairs, Ministry of Trade, Ministry of Finance, Ministry of Cooperatives and SMEs, and Ministry of Industry. At the Ministry of Trade, the programme is dedicated exclusively to exporters from the five commodity sectors, namely textiles, furniture, processed wood, processed fish and footwear. Funds allocated for this programme is Rp 2 trillion, with interest rate of 5.75%.
Incentives	- For private sectors: ✓ The Primaniyarta Award is an award for the most outstanding exporters in the field of exports. The award recipient will receive a special export financing scheme by the Indonesia Exim bank and Standard Chartered Bank (include: export capital financing, investment, guarantees, insurance and trade finance facilities) ✓ Within a period of 5 consecutive years there are 6 companies receiving the award: 1. PT. Bio Farma 2. PT. Growth Asia 3. PT. Indesso Aroma 4. PT. Megasurya Mas 5. PT. Musim Mas 6. PT. Smart Tbk - For the officials: ✓ Implementation of Balanced Scorecard (since 2007) as a tool for measuring the performance of officials becomes very important in efforts to stabilize the management system of planning, monitoring and evaluation of the implementation

	of policies, programmes, achievement of goals and targets set (Strategic Plan Ministry of Trade pp.129) ✓ Product development in the form of design development, adaptation, product, brand development, and provision of information on export products (as an incentive and reduction of dependency on exports to certain products) ✓ Contribute to three strategic plans of Directorate General of National Export Development: 1. The increasing diversification of export markets - Reducing dependence on export markets for certain countries such as USA, China, Japan, India, and Singapore. - To open other prospective markets: Middle East, South America, and Africa - Provision of a book containing information on the market in the form of market intelligence and market brief 2. The increasing diversification of export products In the next 5 years National Trade Committee will be set up with the aim of implementing activities in the field of trade and the establishment of Indonesian Promotion Office as a means to expand market access for goods and/or services of domestic production. (Strategic Plan Ministry of Trade, pp. 125- 126) 3. The improvement of image of exporter and the Indonesian export products - DGNED to provide services for trade relations, both for Indonesian exporter and overseas buyers (online: providing virtual exhibition, offline: international exhibition) - The high frequency of promotional activities - Making TVC (television commercial) in 2013 with the CNN, BBC, CNBC, and Bloomberg - Campaign on international events
Enabling factors	Influencing Policies - Law 2/2009 (Undang Undang) on Indonesia Exim Bank Indonesia Exim Bank can provide financing for the transaction / project that is commercially difficult to implement, but is considered necessary by the government through the National Interest Account (NIA). This law marks the implementation of National Interest Account. Indonesia Eximbank also has Export Oriented People's Business Credit (KURBE) intended for export-oriented SMEs and supporting exports - Finance Minister Regulation No. 134/PMK.08/2015 on Assignment to the Indonesian Export Financing Agency. Influencing Context (general)

	- Rupiah's depreciation contributes a deeper trade balance deficit due to the difference between the value of exports and imports that is widening - Funding provided in State Budget/APBN (IDR 2 Trillion) - Became one of ten Economic Policy Package Ministry of Trade's performance targets on 2019 1. Implementation of Trade Attache a) Number of researches, development, and trade surveys: 24 times b) Number of organizing / participation in exhibitions, publications and trade promotion representatives from the Ministry of Trade abroad: 96 times 2. International Trade Advocacy Services a) The percentage of utilization of advocacy in the framework of the International Trade Agreement Negotiations: 100% 3. Increasing Growth of Non-Oil Exports (value added) and services a) The total growth of non-oil exports: 14,3% 4. Increased Diversification of Export Markets and Products a) Growth in exports of non-oil primary commodity products in 2019 (13.9%) b) The growth of non-oil exports of commodity products prospectively in 2019 (18.9%) c) The growth of non-oil exports to major markets in 2019 (13.5%) d) The growth of non-oil exports to the prospective market in 2019 (18%)
Challenges	- In order to be effective, NIA should ideally meet the following criteria: (I) shall be decided collegially by several ministries / agencies; (Ii) can not be financed on commercial (high risk); (Iii) have a long-term export development prospects; (Iv) boost value added and competitiveness of Indonesian products, (v) set specific and measurable (clearly define); and (vi) is carried out within a certain time period (limited)
Impact	- Any projects which have a high benefit on macro economy and national export interest, but not *feasible* and *bankable* commercially, could run through this programme Pilot Project of NIA: - Production of train by PT.INKA, obtain financing through a banking loan up to IDR 300 billion for exporting railway carriage - Scheme: The LPEI/Indonesia Eximbank will conduct financial analysis to provide export financing contracts based on business-to-business scheme between the actors of exports
Engagement strategy	-
Other engagement	

No	
Cases	Horticulture Agribusiness Area Development (PKAH/*Pengembangan Kawasan Agribisnis Hortikultura*)
Line ministry	Ministry of Agriculture
Working unit	Indonesian Agency for Agricultural Research and Development (IAARD)
Focal point	Horticulture Research and Development Centre (HRDC/*Pusat Penelitian dan Pengembangan Hortikultura*)
Partnership	▪ Directorate General of Horticulture ▪ Agency for Agricultural Technology Assessment (BPTP/*Balai Pengkajian Teknologi Pertanian*) ▪ Local agricultural agency ▪ Farmers group ▪ Private sector
Period	Since 2010
Programmes and incentives	Objectives: To increase production, product quality, horticulture productivity, employment rate and services' effectivity and efficiency. This programme is one of strategic programmes of Ministry of Agriculture. One of PKAH implementation best practice was in East Java. For period of 2010-2013, there were 18 horticulture area in 9 regencies focused on commodities: fruit (mango, orange and pineapple), vegetables (chilli, tomato and green vegetables) and decorative plants (chrysanthemum and tuberose). PKAH locations was selected depends on main horticulture commodities in related area. It was determined by: ▪ market size, ▪ competitive advantages, ▪ economic value, ▪ production area distribution ▪ agro ecology suitability. It was also determined by integration prospect between planting land aspect, packaging and supply chain that influencing to sustainable agribusiness area development. PKAH was implemented through biophysics, social-economy, culture and institutional approaches. By using those approaches, it aimed to be sustainable agribusiness area. The main programme of PKAH implementation is assistance to farmers' group (GAPOKTAN). It applies farmers empowerment model to Horticulture Agribusiness Area, through: 1. Participative learning that gives opportunity to farmers to decide 2. Activities are regularly held in farmers' field and/or agribusiness working area with limited number of participants

	3. Farmers as agribusiness actor could follow all the activities in a period of time 4. Specific location based curriculum 5. Intensive assistance Apart from GAPOKTAN's assistance, PKAH programme also applied technological and institutional assistance to the GAPOKTAN. Technological assistance in PKAH among others are: ▪ Seeds and cultivation technology ▪ Off season technology ▪ New seeds varieties ▪ Pest control ▪ Fertilisation ▪ GAP application ▪ Etc Institutional assistance in PKAH was implemented through several activities, such as: ▪ Cultivation ▪ Marketing ▪ Processing ▪ Production
Enabling factors	▪ Synergy between researchers, extension workers and farmers/agribusiness actors capacity to utilise existing resources ▪ Comprehensive methods and approaches ▪ High commitment and integrity ▪ Good coordination from all stakeholders
Challenges	N/A
Engagement strategy	
Other engagement	
Impact	Profitable production depends on the commodities
Sources	▪

Appendix 6: Innovation practice logs for Maize and Sugar

Innovation practice log: April 2016

University of Mataram & Syngenta partnership to support best practice for dual cropping maize with pulses in NTB drylands.

Organisational context

Universitas Mataram (UNRAM)

Like other Indonesian regional universities, UNRAM's mandated role is to teach, conduct research and undertake public service. Engagement with the private sector has mostly been driven by researchers within the university, who are contracted on an individual basis to conduct the work. The private sector is consulted in terms of course planning but the University is not yet at the stage of using the private sector to reach its goals. This is changing in line with government regulations to allow the University more autonomy over financial management and revenue raising. There is a general support for partnership with the private sector, encouraged by the additional funds this provides to the university (five percent of the project), and the contribution to goals to raise the university's international recognition and network.

At an individual level, the motivation to be involved in this kind of partnership stems largely from personal values, with professional incentives playing a much smaller role. Personally, team members see partnering with the private sector as a potential mechanism to solve some of the key constraints for dryland farmers; or as a way to keep teaching relevant and interesting for both students and staff. Publications are a key requirement for academics and for students, though the perceptions on how publishing would be possible in this project were largely limited to field trials.

PT Syngenta Indonesia

Syngenta is a global agri-inputs company with an ambition to support sustainable food security. The company's 'Good Growth Plan' outlines six commitments that prioritise agricultural, environmental, health and social outcomes. Innovation, collaboration and ethical practice are 'at the heart' of Syngenta's business model.

This is the first time a Syngenta regional office has partnered in this way with a university – past collaborations have usually been focused on provision of inputs such as improved seed for field trials in support of academic research. They had partnered with Asia Crop Solutions (ACS) in a similar way in the past: ACS provided credit to farmers so they could purchase Syngenta seed and other inputs. Syngenta were happy with the partnership as ACS paid on time for all inputs.

Asia Crop Solutions (ACS)

ACS was sold in in late 2015. The former owner, with whom the original project was designed, was committed to supporting Indonesian smallholders despite financial loss incurred in past partnerships where credit had not been repaid. The new owners of ACS re-evaluated the business plans and withdrew from the partnership in April 2016, deciding to withdraw from agriculture all together.

Project context

Driven by UNRAM, the originally project design and partnership was framed around innovation in maize production (use of hybrid varieties, intercropping, changes in crop management). Access to information, credit and inputs for maize has been a key constraint in dryland farming. The university has multiple roles such as technical support to farmers and Syngenta, and facilitating fair contracts between farmers and ACS

as the credit provider. Syngenta's role is in technical support, through the provision of field staff and establishment of Learning Centres to promote and support adoption of the package. ACS' role was to provide credit to facilitate access to inputs through credit, and to purchase maize/pulses at the end of the season.

Policy engagement follows previous patterns of meeting key stakeholders to keep them up to date with project activities, progress and results. The role of government is seen as to embed demonstrated principles/research outputs into programs (ie. Evidence based policy development). The government currently has programs to distribute free/subsidised maize seed and tightly controls the distribution of fertiliser. The team recognise that eventually the private sector will take over this role of seed provision, and there's an opportunity for Syngenta, if it can supply seed to this program, to build relationships that would increase sales once government supply ceases. Broader engagement with government policy or programs in maize has not occurred and is not planned.

The intervention commenced in October 2015.

Significant developments and events

The sale of ACS saw a re-evaluation of the partnership by the new owners. Originally the company signalled they would continue in the partnership as an output purchaser, but not provide credit due to the risk of financial loss. The company subsequently decided to withdraw from agriculture altogether, and has exited the partnership. This has had a profound impact on the project. Short term, alternative credit arrangements and different channels for product sale had to be found. More fundamentally however, the withdrawal of ACS highlighted the need for innovation in credit provision and output market arrangements to support changes in crop production that originally formed the focus of the grant. At the time of conducting baseline interviews, the team were considering avenues to broker relationships between banks and local traders, essentially localising the role that ACS would have played. Working with local traders is seen as a way to protect against non-payment (people are more likely to repay loans from someone they know/someone in the community) although the specifics of how this would work are not yet clear.

The partnership is a new experience for university staff in the project team. In the past, their focus has been on academic research with some form of small scale community services as part of the outcome. Though they have worked with Syngenta and other private companies in the past, these collaborations have been more transactional, for example using Syngenta inputs in field trials or linking local farmers with trade and processing associations. The early stages of implementing the partnership under ARISA have triggered a process of learning how to work together, what the different needs are and trying to understand the 'vision' of the partner organisations and how the university can contribute.

For UNRAM, the partnership with Syngenta is perceived as providing the opportunity to disseminate or scale out the project practices to a significantly higher number of farmers than would otherwise be possible through conventional university models of replication (assuming a new credit source can be found). For Syngenta, partnering with a university that has a good reputation with farmers and government stakeholders is perceived to add a level of legitimacy and trust to their work, with the potential to increase product sales. Beyond this there is an emergent understanding of the potential for UNRAM to support Syngenta to understand the needs and constraints of the broader farming community through sharing of information collected via baseline surveys and other field activities.

Significant external changes

The Indonesian Government set a national, standard price for maize in 2016. The guarantee supports a higher price for one year: 3,150 Rp/kg for grain at 15 percent water content. That is difficult for the farmers who usually sell at 20 percent water content. This is the first time the government have set a standard maize price and it was largely unexpected across the value chain.

Considerations / dialogue points

- Though the withdrawal of ACS has many negative impacts (eg. potential damage of UNRAM relationship with farmers) it appears to have catalysed understanding of more systems-based innovation concepts within the team, shifting emphasis from technical improvement to process and market innovation. While important, this is challenging as the project has changed and shifted beyond the expectations (and comfort zone/past experience) of the project team.
- At the organisational level, the university is aware of the potential for private sector collaboration, but perhaps is not yet fully equipped or able to take advantage of such partnerships to advance university goals.
- There has been a change in thinking in how the partnership can support the research and private sector to achieve their respective goals. What started as a transactional partnership based on supply and demand of inputs, has shifted with each partner seeing the other as key to achieving broader scale out. There are early indications that this is also expanding such that Syngenta sees a role for UNRAM in providing information and analysis so they better understand farming households, adoption decisions and their potential market.

Innovation practice log: April 2016

Indonesian Sugar Research Institute (ISRI), PTPN X and Trunojoyo University partnership to support improved market linkages, commercialisation of agricultural innovation and an enabling policy environment to increase the incomes of smallholder sugarcane producers in Madura, East Java.

Organisational context

Pusat Penelitian Perkebunan Gula Indonesia (Indonesian Sugar Research Institute - ISRI)

Historically ISRI has been a public funded research institute charged with developing improved sugar varieties and allied technology that was provided as a free service to the sugar industry. The Indonesian Government stopped all funding to ISRI, only reinstating a small amount of core funding to maintain research facilities in early 2016[7]. ISRI has the ambition (and incentive) to play the role of science informed sugar innovation agency, however has struggled to secure funding from industry despite close historical links and attempts to engage in new ways (eg. provision of training to farmers). Though the development of varieties is long-term and expensive, industry interest in funding variety development is limited, and ISRI survives on short term projects. A current focus is to 'open the mind' of companies about who will deliver varieties and other technologies if there is no financial support.

PTPN X

State owned enterprise PTPN X has a long history, tracing its origins back to a commercial plantation and milling operation under Dutch colonial rule. PTPN X is currently the largest sugar producer in the country.

Prior to 1975, farmers were required to rent land to companies for sugar production. From 1975 this changed with a Presidential decree that sought to encourage smallholders to produce cane themselves, externalising supply for factories. PTPN X has since collaborated with ISRI to develop smallholder suitable technology.

Universitas Trunojoyo Madura

Originally established as a private university, Trunojoyo University was redesignated as a public or state university in 2001. Staff are strongly encouraged to collaborate with the private sector if it can be balanced with their teaching responsibilities. Publications are also encouraged as they contribute to the accreditation of the University. Tunojoyo is located within the study area, and thus is identified as / sees itself as a stakeholder in how the island develops.

The University's role in the partnership is focused on the provision of social science capability. As a relatively young university, there are strong personal and professional incentives to build these networks and deepen the collaborations and subsequent opportunities for students and junior researchers.

Project context

The Government has set a goal of self-sufficiency in sugar production by 2019. The prospective annual demand for sugar is 5.8 million tonnes - Indonesia produces 2.7 million tonnes. The government has ear marked Rp42.5 trillion to invest in building 10 new mills from 2015 to 2020.

As part of efforts to increase sugar supply, The Ministry of State Owned Enterprises has given PTPN X the responsibility of developing the sugar cane industry in Madura. Madura has no history of sugar cane

[7] All ISRI assets remain government property

production and the conditions are less favourable than the main producing areas on Java, however there is a perception that Madura has more land available.

In 2013, all three organisations were involved in a feasibility study of sugarcane production in Madura. The study looked at problems experienced by farmers in cane production and potential technical improvements as well as the role of local actors and leadership in influencing household decision making. The current partnership seeks to build on the findings and relationships generated under the feasibility study to increase production and quality of sugarcane on the island.

ISRI is supporting the introduction of new varieties and best management practices; PTPN X will provide credit for purchase of inputs and support improved management of post-harvest transport, market linkages and guaranteed prices. University Trunojoyo is essentially contracted to support baseline and focus group discussions in the early stages of project implementation.

The intervention commenced in December 2015.

Significant developments and events

The contracting of Trunojoyo University to bring sociology skills to traditionally agriculture-dominated research in the feasibility study, and continued through ARISA is noteworthy. There is an aspiration within Trunojoyo that this contractual relationship deepens in the future, allowing social science to have a greater role in how projects and research questions are defined. For PTPN X and ISRI, the smallholder farmer looms large in the challenge of increasing sugar production. The skills and expertise in sociology are seen as potentially providing key insights into how to shift farmer behaviour and meet production goals.

Should the project proceed as planned, significant institutional innovations are expected at the local level, mostly relating to demarcation of land ownership and 'land grouping' to allow for mechanised harvesting.

Significant external changes

None at time of baseline.

Considerations / dialogue points

- Changes to the funding environment have been fundamental to ISRI attempting to change its models and approaches to research and collaboration with industry. ISRI already has close relations with industry and therefore the opportunity exists to help it better fulfil its sugar innovation role with various forms of technical and organization capacity building.
- A shift is required in how ISRI attempts to 'service' the industry and how it demonstrates the business case or value to the industry, which has implications for potential capacity building activities. In parallel, there is significant scope to shift the expectations in industry to acknowledge government withdrawal of research funding, and the potential role and benefits to industry players in bridging this gap.

Trunojoyo sits outside the 'core' partnership, though the issues they examine are central to the concerns of all partners in terms of how to support fundamental change within the social and farming system (eg. land use change, collectivised harvesting).

Appendix 7: Financial acquittal for the period January 1 to June 30, 2016.

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION

CERTIFIED STATEMENT OF RECEIPTS AND EXPENDITURE Incurred by CSIRO on the **DFAT-Applied Research and Innovation Systems in Agriculture;** project Agreement number 68498 - received from DFAT, for the period **1 Jan 2016 to 30 June 2016**

	(A$)
Balance Brought Forward	**297,853.03**
Add receipts	
Contributions	1,500,000.00
Less expenditure	
CSIRO Labour	202,543.73
Travel	160,111.15
Operating (includes in-country labour costs and interventions)	431,159.53
Total Expenditure	**793,814.41**
Balance Carried Forward	**1,004,038.62**
Commited carry over	1,004,038.62
Uncommited carry over	

Prepared by: Sonja Slatter Date: 25.07.2016

Approved by:

I, Bhagya Epasinghe, being an authorised representative of the Recipient Institution certify that:

(A) all Funds were spent for the purpose of the Activity and in accordance with this Agreement and that the Recipient has complied with this Agreement and
(B) the amount remaining in the account referred to in clause 6.3.

Authorised person signature: ..... Date: 5/08/2016
Bhagya Epasinghe - Finance Manager