Applied Research and Innovation Systems in Agriculture (ARISA)

Semester Report No. 2, December 2015

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 8-10 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 second Semester of the project was satisfactory.** Most aspects of the project have been progressing well. As described below, a number of interventions are in place and the process for DCED and broader monitoring and evaluation are developing satisfactorily.

   We have undertaken most of the activities in the 6-month workplan. The main sticking point for the project has been the length of time to procure an HR outsourcing company, required to employ local staff. A contract with KPSG has now been agreed and we are awaiting final documentation sign-off from BPPT.

   An informal Project Coordination Meeting between BPPT, CSIRO, and DFAT was held in September 2015, when the Deputy Chairperson of BPPT (Bu Lies) and other senior staff in BPPT visited Surabaya. Bu Lies stepped down as Deputy Chairperson in October 2015 and she has been replaced by Dr. Eng. Eniya Listiani Dewi. It will take time to build a new relationship with Bu Eniya as she comes into the role without a good understanding of ARISA or the broader interactions between CSIRO and BPPT.

   Engagement with PRISMA has ramped up in the second half of the year and there is now regular contact and discussion on how we can inform and leverage of each other's interventions. This engagement will continue to grow in the coming year. We have also initiated discussions with SAFIRA to assist with one of the ARISA interventions.

b) **Implementation of first grants and pipeline for new grants is on track.** Four interventions have been implemented and another two are in the final development or contracting stage. Four of these are in East Java and two are in NTB. This upcoming wet season represents the first major cropping season to test many of the applied research technologies. This is likely to provide some challenges given the strong El Nino event currently underway. The potential consequences of this El Nino have been discussed with partners in the interventions.

   Rob Caudwell has made two trips to NTT to garner interest in ARISA and to seek Expressions of Interest. We are currently following up on two possible interventions (seaweed and tamarind). Both the research institutes and the private sector have less capacity in NTT so this will a more challenging region to establish successful research – private sector partnerships.

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.

d) **Strategic Review Panel.** The Strategic Review Panel in September examined ARISA's progress to date since inception in January this year. They found ARISA has made a good start but they provided recommendations in three areas: private sector engagement, results chains, and innovation systems research. ARISA is responding to all these recommendations. In particular, the private sector engagement recommendation response has three elements to it: closer engagement with PRISMA and drawing on their experiences and capacity to assist ARISA; engagement of a consultant to look at private sector engagement across the ARISA interventions; and ensuring stronger private sector involvement and leadership in remaining interventions as they develop. Good progress is being made in all three of these strands of private sector engagement.

3. BUDGET

Expenditure on project management (Australia and in-country) is in line with the budget. The operational budget is somewhat underspent but with interventions now being implemented it is starting to ramp up quickly and is expected to be on track by the end of the 2015-16 financial year.

Table 1. 2015-16 Year to date expenditure vs budget (to the end of October 2015)

2015-16 Budget	Planned	Actual
CSIRO Project Labour	$110,967	$103,671
CSIRO In-Kind (Project support and overheads)	$125,937	$109,220
Travel and Operating (includes in-country labour costs and interventions)	$489,585	$292,694
Total	$757,822	$599,508

1. BROADER POLICY AND INSTITUTIONAL CONTEXT

The Ministries of Research and Technology (RISTEK), in which the Agency for Assessment and Application of Technology (BPPT) sits, merged with the Ministry for Higher Education (DIKTI) in late 2014. This could provide some additional opportunities for ARISA in fostering research partnerships as universities sit within DIKTI.

The GoI has developed the 2015-2019 National Mid-Term Development Plan (RPJMN) which aims to reduce poverty by 50% from 2014 to 2019. Associated with this poverty reduction is an increased focus in five key primary production commodities (maize, sugar, rice, meat and fish). This direction aligns well with the pipeline of interventions in ARISA, which involve most of these sectors.

2. PROJECT MANAGEMENT AND PROGRESS

(a) Project Personnel

The small local team of Rob Caudwell and Lauren Xie have worked very effectively to get interventions in place, DCED compliant Results Chains and baseline measurement approaches implemented. However, the team is in need of additional capacity to support them.

The process of tendering for an HR outsourcing company to hire local staff and to reach an agreed contract has taken considerably longer than anticipated and the contract was only agreed in late in November. It has taken a large amount of time to negotiate with the successful company (KPSG) the requirements to meet DEPNAKER (Manpower) regulations so that they can hire staff on our behalf.

Job descriptions have been developed for an Intervention Manager, Finance Manager and Admin Officer. In addition to these positions it is recognised that we need additional capacity in monitoring and evaluation and in capacity building. Therefore, it is our intention to recruit an additional position in monitoring and evaluation. Across these two additional positions of Intervention Manager and Monitoring and Evaluation Coordinator, as well as the Grants Manager and the Results and Measurement Manager we are hoping that provides sufficient additional resource to provide some scope to meet additional capacity building needs.

(b) Project governance

The Project Leader from CSIRO has visited Indonesia four times in the last six months. These visits are to assist with 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.

An informal Project Coordination Meeting between BPPT, CSIRO, Daniel Nugraha and Jim Tomecko was held in September 2015, when the Deputy Chairperson of BPPT (Bu Lies) and other senior staff in BPPT visited Surabaya. This provided the opportunity for BPPT to see the Surabaya office, to discuss progress in ARISA, and to explore collaboration opportunities.

Bu Lies stepped down as Deputy Chairperson in October 2015 and she has been replaced by Dr. Eng. Eniya Listiani Dewi. It will take time to build a new relationship with Bu Eniya as she comes into the role without a good understanding of ARISA or the broader interactions between CSIRO and BPPT.

(c) Strategic Review Panel

The Strategic Review Panel met in September and there was a focus on ARISA, which included field visits and a discussion session in Surabaya. Overall assessment from the SRP was that ARISA had started well. The SRP had three actions for ARISA to pursue:

1. *Support ARISA to adopt the market development approach in practice for each intervention and to use short-term market facilitation inputs to negotiate and finalise deals.*

This is being actioned through two approaches. The ARISA team in Surabaya has ramped up engagement with relevant Intervention Managers in PRISMA, with emphasis on the beef, dairy, IPM and seaweed interventions. As a result of the interactions with PRISMA on seaweed there is an opportunity to have a joint intervention in NTT. The second approach has been to interact with Tim Stewart (recommended by the SRP). CSIRO is currently in negotiations with Palladium to engage Tim Stewart early in 2016 with follow-up mentoring and input to occur through 2016.

2. *Refine the ARISA results chains and Monitoring/ Results Management Guide to better reflect causal mechanisms linking exposure of farmers to innovations, adoption, commitment to new behaviours and income change.*

Results chains have been revised following discussions between Lauren Xie and John Fargher, and Lauren Xie and the DCED consultant Hans Posthumus. This process of iterative improvement and change will be ongoing. One of the positives of the Results Chains is that they have been developed in partnership with the project teams (private sector and research institutes) rather by ARISA alone and so there is good ownership of them.

3. *Arrange an exchange between the Knowledge Sector Initiative and ARISA to explore innovation systems analysis and research in Indonesia*

The SRP alerted ARISA to the Knowledge Sector Initiative (KSI) noting that "KSI and ARISA have complementary components around innovation systems research which should be coordinated to avoid duplication". KSI has developed a large range of diagnostic assessments including The Political Economy of Policy Making in Indonesia by Ajoy Datta, Harry Jones, Vita Febriany, Dan Harris, Rika Kumala Dewi, Leni Wild and John Young. This and other related documents provide a valuable general overview of the policy making landscape in Indonesia. The proposed scoping study by CIPG will be able to draw on this back ground information in its exploration of champions, process and politics that specifically related to the institutional and policy setting of agricultural innovation at the public private sector interface. Recognising the clear synergy with KSI the ARISA innovation systems research team will meet the KSI in Jakarta during upcoming travel in early 2016 to ensure duplication is avoided and explore the potential for complimentary and join activities.

3. INTERVENTION PROJECTS

Four interventions have now been implemented, another two are in the process of being contracted and discussions continue on future two interventions. Progress and challenges on the individual interventions are outlined below.

Interventions currently implemented

1. Maize and pulses

This intervention involves the use of best practices for dual cropping models using new superior maize hybrid varieties with pulses (mung bean and ground nut) on drylands in NTB. The partners are PT Syngenta Indonesia, PT Asia Crop Solutions and the University of Mataram. The intervention will target about 1,500 smallholder farmers in East and North Lombok.

The intervention aims to improve the knowledge and skills of maize farmers in dryland areas to implement best practice for producing their crops, and to increase the yield of maize by improving the growing technology for new superior maize hybrid varieties. Maize seed will be sourced from Syngenta and Syngenta will also construct Learning Centres in East and North Lombok. Through the involvement of Asia Crop Solutions who have guaranteed to purchase maize (and probably mung beans) the intervention will also improve post-harvest handling of maize, mung bean and ground nut. It will also strengthen the participation of women in these farming systems. The involvement of ACS will improve the marketing channels for maize and pulses (mung bean and ground nut) outputs. The dual cropping model, hybrid maize with pulses, will provide a mitigation strategy against uncertain climatic conditions, especially rainfall, as the pulses are short season crops that can grow and thrive with relatively low rainfall.

Based on the partnership capacity building, there is a very good working relationship between UNRAM, Syngenta and ACS. Professor Komang, from UNRAM, is a strong champion for the project, and is driving the intervention with much energy and commitment. Early activities in this intervention have been to recruit smallholder farmers to test the new maize-pulse farming system strategies and to multiply new varieties of mungbean seed for testing by farmers. A small irrigation area in North Lombok was established and a seed crop of mungbean was successfully produced ready for the cropping season that will commence with wet season rains in December 2015.

It was originally proposed that ACS would provide input credit to farmers at zero interest. There is a new owner of ACS and they don't in the short-term want to proceed with the zero interest input credit arrangement though they are still heavily involved in the project through purchase arrangements and input to farmers on post-harvest handling. Discussions have commenced with Clay O'Brien in SAFIRA to explore alternative approaches to financing inputs.

2. Beef

This intervention involves the development of profitable and sustainable beef production system in Sumbawa NTB, through engagement of cattle farmers with a beef processing company. The partners are University of Mataram and PT Dharma Raya Hutamajaya. It includes field level collaboration with the Marine, Fisheries & Livestock Dinas, West Sumbawa District and the Livestock Dinas, Sumbawa District. The intervention will target approximately 1,000 farmers in West Sumbawa and Sumbawa Districts

The intervention will improve the value chain partnership between smallholder cattle farmers in Sumbawa and PT Dharma Raya. The company has a meat processing factory in Sumbawa and markets higher value, differentiated beef cuts in Jakarta. During the intervention the company will purchase all beef produced by farmers at premium rates, 10% above trader value, if it meets their market specifications of weight for age. The intervention aims to increase the daily weight gain of fattening cattle through better feeding and management, mainly through the use of Leucaena, a tree legume that is very suited to the environment in Sumbawa. This should lead to productivity increases of at least 50%. Through the partnership with PT Dharma Raya, the intervention will improve beef quality, healthiness and traceability.

Since implementation of the intervention, PT Dharma Raya and UNRAM have formed a good working partnership and the partnership capacity building workshop was very successful.

On the ground activities that have commenced include:

- Establishment of forage nurseries (mostly leucaena and a small number of sesbania) that will provide seedlings to be transplanted to farmers' lands in December or early January.
- Selection of 10 farmer groups for Year 1 has commenced (30 farmers per group) to be completed by December
- Strong support from local government authorities who want to see improvement of cattle productivity and beef sale (instead of live cattle) from Sumbawa.

One of the challenges for this project will be the ability of PT Dharma Raya to break into the local market, which is dominated by traders. This will take time and a patient building of trust between the company and smallholder farmers.

3. Cassava

This intervention involves the development of integrated modified cassava flour (MOCAF) chip clusters for improving the welfare of smallholder cassava farmers in the southern part of East Java. The partners are PT Bangkit Cassava Mandiri and University of Jember, along with the involvement of the KEHATI Foundation (NGO), plus a range of farmers' cooperatives and groups. The incomes of approximately 1,600 farmers will improved by 30% or more by October 2018, through improved cassava production and processing. The intervention is operating in the districts of Jember, Lumajang, Malang, Blitar, Tulung Agung, Trenggalek, Ponorogo, and Pacitan in East Java.

PT Bangkit Cassava Mandiri has a processing factory in Solo, and markets higher value cassava products. It is currently operating well below capacity and wants to encourage more cassava production and local-level MOCAF processing. Its contribution to the project is by offering a guaranteed market linkage and price premium for MOCAF chips and in providing advice on quality requirements. At the level of the cluster, the intervention will work with the company to develop improved processing methodology for MOCAF chips to meet market demand. The intervention will also utilise the by-products of MOCAF processing, such as nata de cassava, that can be sold, and organic fertilizer, that can be used in cassava production. In this way, the intervention partners will also test and develop an integrated farming system for cassava producers which aims to increase cassava productivity on farm, as well as improving the self-reliance and independence of cassava smallholders through the institutional strengthening of farmer groups and cooperatives.

The intervention started up in mid-October with the establishment of compositing facilities (liquid and solid) to be used for cassava production. Cassava planting material has been obtained and is currently being planted by smallholders. Approximately 200 farmers have already confirmed their interest to participant in the first year, with more expected to follow in the next 1-2 months. A CSIRO specialist in plant nutrient and soils visited the intervention sites in November to assess the planned compost and fertiliser inputs for the first season of cassava production. Work has started on the new MOCAF processing cluster that will be part of the intervention.

4. Integrated pest management

This intervention has a different mode of operation to the others, with the ARISA project having a much more "hands on" role in the implementation. The intervention is focused on developing an IPM solution for smallholder producers of shallots in East Java. Shallot production is one of the highest users of crop protection products in Indonesia, with average crop protection spend per crop cycle approximately USD 1,500 per hectare. Overall, shallots have the potential to be a high value crop but the input costs of insecticides and significant crop losses due to major pests impact the potential profitability for many farmers. Typically, a range of broad-spectrum insecticides are applied, with up to 90 applications during the shallot season, causing additional problems with resistance and environmental impact.

As part of this intervention, in collaboration with IPM Technologies from Australia, the ARISA project has conducted a pilot study or proof of concept to test a new IPM strategy for shallot production in East Java. The pilot was then conducted between July and October in two geographic locations in East Java. It was very successful, demonstrating the potential to grow shallots using biological pesticides and "soft" chemicals only, with much reduced frequency of application, as part of the IPM strategy. In this way, it was possible to significantly reduce insecticide costs and improve the profitability of smallholder shallot production by 45% (See Appendix 1 for financial analysis).

The next step in the intervention is to establish partnerships with the private sector in order to take the IPM innovation to a scale of approximately 1,500 farmers. Negotiations are currently on-going with the international companies Sumitomo and Nufarm, who the suppliers and distributors of one of the biological pesticides tested in the pilot. Negotiation have also started with PT Nasa, which is a supplier of biological products for agriculture in Indonesia. It is expected that scaling up of the intervention with 1-2 commercial partners will commence in April 2016, with a further testing of the IPM innovation to be conducted for wet season shallot production in the meantime, from October 2015 to March 2016.

Interventions being progressed to Agreement

1. Sugar

This intervention will increase the incomes of smallholder sugarcane producers in Madura, East Java through improved market linkages, the commercialisation of agricultural innovations, and an enabling policy environment. The partners are PT Perkebunan Nusantara X and the Indonesian Sugar Research Institute, along with the involvement of Trunojoyo University and various Estate Crops Agencies in Madura. Through the leadership and operational support provided by the company PTPN X the intervention will reach more than 2,000 smallholder farmers by November 2018. This will be done in a stepwise manner in 6 sub-districts from 3 districts of Madura: Bangkalan, Sampang and Pamekasan. The design of the intervention has been developed and agreed with the various partners and is ready for contracting.

The intervention will improve the market linkages for smallholder sugarcane producers and increase their production and productivity. It will encourage new farmers to grow sugar cane and help existing farmers to improve their profitability. As part of this process, agricultural innovations will be tested and disseminate for rain fed and irrigated sugarcane production. In addition to this, the intervention will investigate the

feasibility of land grouping to give potential economies of scale and allow for mechanization. Madura is an attractive location for the intervention because of the good infrastructure and availably of land, and in the longer term the company PTPN X has plans to build a sugar processing factory there. But for this to happen, significantly more farmers need to start growing sugarcane and this is partly dependent on the feasibility and use of irrigated production, something that will be tested and developed as part of the intervention.

The intervention is expected to start in January 2016, but initial work has already begun, with the company establishing deep tube wells to enable irrigated sugarcane production and engaging with farmers to encourage them to grow sugarcane in the coming season. As part of the intervention, with company will provide a guaranteed market linkage with a price premium for the smallholder producers, along with minimum sugar extraction rate of at least 8%.

2. Dairy

This intervention will test and develop fodder farming business models for smallholder dairy production in East Java. The partners are PT Nestle Indonesia, PT Cargill Indonesia, and Brawijaya University, plus a range of dairy cooperatives and farmer groups. The intervention will increase the incomes of smallholder farmers through the commercial production of fodder, together with improvements to the fodder supply chain, the use of total mixed rations, and the promotion of best practices for dairy farming. The intervention is currently being finalised with the various partners, with contracting expected in January 2016.

Of the 950 tonnes of milk produced by smallholders each day in East Java, Nestle processes 550 tonnes. The company has contractual supply chain linkages with many thousand smallholder dairy producers. It is through the leadership and co-investment provided by Nestle that this intervention will deliver benefits to smallholder producers. This intervention will be led by Nestle's staff in East Java with a significant level of co-investment from the company.

The intervention will establish a fodder nursery to test different fodder types and to supply smallholder fodder farmers. It will establish a profitable fodder farming model for smallholders, and then disseminate and commercialise this fodder farming model, for both individual feed products and total mixed rations. The involvement of Cargill will be important in the development of TMR, whilst Brawijaya University will focus on the testing and development of fodder. The intervention will also disseminate promote a range of best practices for dairy production, including improved feed and feeding, done by Nestle's network of field staff, through their regular interactions with farmers and farmer groups.

Pipeline interventions

ARISA engagement in NTT started in October 2015, with a Roadshow at the University of Nusa Cendana in Kupang. This was followed by interactions with the PRISMA Portfolio Managers and Business Consultants about attractive sub-sectors and potential private sector partners, then direct communication with a range of agricultural companies in NTT.

Following on from this, there are two potential interventions to be scoped in NTT during the next 2-3 months:

1. Seaweed in Sumba and Rote – involving PT Algae Sumba Timur Lestari and/or UD Alga.
2. Pig feed in mainland Timor – involving UD Mari Ternak.

These two potential interventions look promising, but it is still too soon to be certain whether one or both will proceed to full interventions. A follow up scoping visit will be conducted in NTT during December, to further engage the partners from the companies and the university. It is encouraging that there is potential to collaborate and link with PRISMA interventions in both of these areas. For seaweed, UD Alga is one of the intervention partners for a PRISMA seaweed intervention in Rote and the company is very interested to

test and develop a range of innovations with ARISA. For pig feed, ARISA's interest is with the testing and development of tamarind seed, and there is potential to link with the PRISMA interventions on cassava for pig feed and the general market development for the pig sub-sector in Flores and mainland Timor. These opportunities will be further investigated during the coming months.

4. DCED, MONITORING AND EVALUATION

ARISA conducted a DCED document scan on its MRM system with Hans Posthumus, a DCED auditor and consultant in October and November. The rationale for conducting a document scan rather than a pre-audit was that it would be more helpful at this stage of the project to improve and strengthen the MRM system before the interventions have begun. In contrast, the pre-audit review would score ARISA's performance against the specific criteria in the DCED Standard. This would have provided limited insight into ARISA's future compliance given that many of the criteria are only relevant after the interventions have been running for some time.

The process has entailed a detailed review of the MRM system in collaboration with the Results and Engagement Manager. It has taken place over email and Skype calls, including two conference calls with the larger ARISA team.

In addition to revisions made to the specific MRM documents within each project, the MRM process, resources and roles and responsibilities were reviewed. The outputs of this are a revised MRM Manual including a comprehensive roles and responsibilities matrix that accounts for resourcing and maps who does, who is involved, and who approves each activity. This will be useful for overall coordination of both MRM and capacity building efforts within the interventions between the ARISA team in Australia, in Indonesia, and the intervention M&E teams within each of the research institutes.

More detailed information on the process and outputs of the DCED document scan can be found in Appendix 2, which contains the preliminary findings from Hans Posthumus.

A Practice Note on lessons learnt so far in applying the DCED standard within ARISA has been prepared by Lauren Xie and it contains useful insights into the application of DCED to an innovations systems project such as ARISA (see Appendix 3).

5. COMMUNICATION

Through PRISMA, AIP-Rural is establishing a website that will be operational in January or February 2016. ARISA will upload content to the website when it becomes operational. Work has commenced on developing a series of two-page descriptions of each of the interventions. The first four of these will be completed by January 2016, ready to be uploaded on to the ARISA website pages.

A number of information sharing sessions have been held with PRISMA and Andrew Ash has provided information to PRISMA and to Syngenta (via Jim Tomecko) on the potential impacts of El Nino and possible responses to manage some of the impacts of drought in eastern Indonesia (Appendix 4).

6. CAPACITY BUILDING

In the last 6 months capacity building has largely focused on international best practice in partnerships and the development of a partnership agreement based on these principles, and the development of the DCED standard results chain and monitoring plans. A small session on innovation and partnerships has been include in the partnership training but this will be built on in 2016 when a fuller capacity building module and process is developed. Two new trainings have also been added on women's economic empowerment (WEE) and human ethics relating to activities. The WEE capacity building has been added to ensure that

ARISA is in line with the DFAT Aid framework (2014) and Operational Guidance on Women's economic empowerment and gender equality (2015) to ensure as a minimum 'no harm' is done to women and where possible interventions enhance economic development of women. The ethics training has been included 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).

In August, the partnership capacity building was undertaken with UNRAM-Pt Dharma (beef intervention) and the agreement has been completed and signed by both partnerships. A second workshop was held in October with UNRAM-ACS-SYNGENTA (maize-mung bean intervention) and a draft agreement has been prepared and is awaiting signature. The third partnership agreement between UNEJ, Politeknik Jember, PT. Bangkit Cassava Mandiri (PT. BCM), Bina Sejahtera Coop (Farmer's Group) and Bangkit Mandiri Sejahtera Coop (Farmer's Group) (cassava intervention) was postponed when the capacity building coordinator was unable to travel to Jember due to volcanic activity. This workshop is being scheduled for February.

Overall the capacity building on partnership has been very positive and the intervention projects see the value. This was particularly important for the UNRAM-ACS-SYNGENTA partnership which has changed slightly due to change in ownership of ACS. The agreement helped highlight risks for all of the partners, define roles and responsibilities more clearly and identify a conflict resolution process.

The gender and ethics trainings have been undertaken with the maize/pulse and beef projects. The gender training is undertaken as part of the preparation for the women's focus groups which were held in November and December to determine appropriate interventions for women's economic empowerment through the partnerships. The ethics training was also to provide the appropriate ethical framing as the partnerships start to work with smallholder farmer groups. An ethics pack has been developed to support the capacity building. This pack sets out the ethical principles and requirements, such as privacy and confidentiality and complaints. It also provides examples of specific documents needed to comply with Australian standards, such as participant consent forms for baselines, focus groups and working on grant activities.

There are a number of challenges being experienced in the capacity building, including:

- The grant partners are struggling with the number of trainings they are participating in and the time implications, as well as the additional activities that have come out of the trainings such as the partnership agreement, developing the results chains and monitoring plans, the women's focus groups and developing material to conform with the ethical practice.
- As a result of the bullet point above, the CSIRO team has taken on some of the additional load of preparing documentation, thus increasing the team's workload. The CSIRO team is undertaking a review of workload and time allocation in order to assist in prioritising activities, especially with regards to capacity building commitments.
- While all of the capacity building is being tailored to incentivise the private sector, it is becoming increasingly evident that there are diminishing returns of some of the capacity building for them. The partnership training has been well received but the gender and ethics is seen as less relevant to day-to-day activities of the companies. CSIRO is working on ways to ensure their ongoing commitment by revamping the capacity building after each session based on feedback and linking the capacity building more clearly to the resultant activities and outcomes. It is anticipated in the 6 monthly reflection processes discussions will also assist with this refinement.

7. RESEARCH

(a) Innovation systems research

The milestone for this semester is "One study aimed at policy makers which identifies significant opportunities for RI-PS collaborations is conducted and shared with public officials". The pilot interventions of ARISA are not yet at a sufficient level of maturity to draw meaningful lessons and nor highlight opportunities for public-private sector collaboration.

Instead the focus of the innovation systems research component in this semester has been exploring ways of engaging stakeholders in the policy community in meaningful dialogue on the experience of ARISA and in particular the lessons emerging from this for institutional and policy reform. It is recognized that the range of policy and institutional issues related to enabling agricultural innovation in Indonesia sit across a number of organizational, departmental, and ministerial domains. Like many other countries different policy domains related to agricultural innovation (agricultural, business and innovation, science, technology and education) operate independently with limited coherence and often with otherwise complimentary schemes competing for political support. The political economy of policy and institutional change is equally complex due to existing patterns of political patronage and support (pers. comm. Jimmy Tanaya, Centre for Innovation Policy and Governance). It is within this policy and political process that ARISA needs to find champions and windows of opportunity for leveraging its lessons and experience.

To advance this ARISA has engaged with the Centre for Innovation Policy and Governance (CIPG), an independent Indonesian policy think tank with an intimate understanding of the Policy and political landscape with specific reference to innovation. As a starting point for developing a meaning dialogue process with relevant policy stakeholders a draft set of terms of reference has been developed (Appendix 5) for a scoping study to develop an influence map and define an appropriate engagement strategy for dialogue. Terms of reference are currently being negotiated with CIPG and the study of approximately 3 months in duration will begin in early 2016.

Looking forward to the next semester a workplan has been developed to schedule the collection of information to capture the experiences and lessons of the pilot interventions. Central to this is the development of innovation practice log. This will be used as a mechanism to document if and how public/private sector actors in each partnership change their practices and perspectives through the life of the project and the implications this may have for institutional and policy reform. The focus will be on the documentation of changes within each of the research propositions outlined in the Innovation System Research design document (section 4, page 6). Changes at the on ground / farmer level will also be captured, but the main focus will be on the public-private partnership.

(b) Economic impacts of scaling up and out

The interventions in each project grant can occur at multiple stages in the value chain. Therefore an analytical framework that can capture interactions between different stakeholders in the value chain (e.g. farmers, traders, processors, input suppliers, etc) and identify potential supply constraints at different stages of production, is needed. We have developed such a model framework for the Sumbawa beef project using the iThink software, which is often used by industry to simulate and improve business processes.

One of the main interventions in the Sumbawa beef project is the introduction of the perennial legume leucaena, to allow cattle to be fattened in the dry season – a time when quality forages are normally unavailable. By taking a system-wide view of the value chain we can assess and identify:

1. The direct benefits to farmers fattening cattle
2. Upstream benefits that are transferred to cattle breeding farms

3. Downstream benefits that accrue to the PT Dharma abattoir from increased throughput of higher quality animals
4. Bottlenecks such as shortages of weaners supplied to feedlots from the breeding sector, and feed constraints related to seasonality
5. Upstream benefits of price premiums that PT Dharma plans to introduce to secure better quality animals for slaughter

We developed our preliminary model based on data gathered from the project proposal, project field trips in August 2015, and various interviews conducted by staff in a related ACIAR project. This model will be refined using more accurate value chain data, to be collected during a weeklong visit to Sumbawa by the CSIRO economics researchers from 13-18 December 2015. By February 2016, the model will be finalised and used to assess project impacts across the value chain, but particularly those that accrue to smallholder farmers (the main target group in ARISA). Where possible, it will also be used to help inform and revise the construction of effect intervention packages. Finally, we also wish to build capacity among UNRAM staff in using the model framework to ensure that it has lasting impact.

In January 2016, we plan to extend the application of this framework to the dairy and MOCAF cassava interventions.

8. ETHICS

CSIRO is obliged to comply with the Australian National Statement on Ethical Conduct in Human Research. All research involving human participants must be approved by CSIRO's Social Science Human Research Ethics Committee, which is an independent governance body. An overarching approval for the ARISA project was obtained in late 2014 prior to ARISA commencing. However, a requirement of that approval was to obtain subsequent approval for each of the intervention projects in ARISA. In the last six months, Ethics clearance has been obtained for the IPM, beef, maize/pulse, cassava and sugar interventions. The application process for obtaining ethics clearance is quite time consuming. The application form for the sugar intervention is attached by way of example (Appendix 6).

As indicated above in Section 6 on Capacity Building, training in ethics has commenced with partners and to complement this training an ethics guidance has been produced (Appendix 7).

9. BUDGET

Expenditure on project management (Australia and in-country) is in line with the budget (July – November). With interventions coming on line operational expenditure is increasing.

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2015-16 Budget	Planned	Actual
CSIRO Project Labour	$110,967	$103,671
CSIRO In-Kind (Project support and overheads)	$125,937	$109,220
Travel and Operating (includes in-country labour costs and interventions)	$489,585	$292,694
Total	$757,822	$599,508

10. CONTRACTED MILESTONE DELIVERABLES

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

I. At least 4 RI-PS collaborations are negotiated and signed
Three RI-PS collaborations have been negotiated and sub-contracts signed (maize/pulse, beef, cassava – see above for details in Intervention section). A fourth RI-PS collaboration in sugar cane (see details above in Intervention section) has been negotiated and the contract is in the process of being signed.

In addition to the formal sub-contracts, separate partnership agreements are being developed. These partnership agreements are more about how the partners will operate with each other and are about culture and values rather than business aspects of the partnership and form part of a broader capacity building initiated. Two of these partnership agreements have been completed (maize/pulse and beef) and it is expected cassava and sugar cane will be completed early in 2016.

II. At least 4 credible business plans are elaborated between RIs and private sector collaborators
In addition to the four interventions already underway or nearly underway, which have credible business plans in terms of viable company involvement and which meet criteria for increasing incomes of smallholders, business plans are being developed for other interventions. These include:

(a) Integrated Pest Management. Following the successful pilot study on IPM at Probolinggo and Pare, discussions have commenced with PT Nasa and Sumitomo Pty Ltd to determine whether there is a viable business opportunity to scale-up the IPM technology. It is expected that these discussions will be concluded by March 2016 and a decision on whether a credible business plan can be put into practice will be made at that time.

(b) Seaweed in NTT. This possible intervention could involve University of Nusa Cendana (UNDANA), PT Algae Sumba Timur Lestari and/or UD Algae. PRISMA already has an intervention underway with UD Algae and ARISA and PRISMA team members met with UD Algae in November 2015 to discuss possible activities associated with an ARISA intervention, that would be undertaken in partnership with PRISMA. It is expected a business plan would be developed by March 2016.

(c) Tamarind seed as pigfeed in NTT. This possible intervention would involve UNDANA and UD Mari Ternak. Discussions to further a business plan will take place in December 2015.

III. At least 8 firms confirm their interest in collaborating by month 9 on innovations that meet the criteria of the project

During the first phase of the project where Expressions of Interest were sought, more than 90 different companies showed interest in working with research institutes. With the four interventions underway or nearly underway and three other interventions progressing well in their development (IPM, dairy, Seaweed) we already have 10 companies who meet the criteria of the project and five of these companies are already “signed” up.

In addition to those firms getting engaged in interventions, we are receiving unsolicited interest from firms to work with ARISA (e.g. UD Algae, PT Sadhana, Eco Solutions Lombok). We have set aside some resources for emerging opportunities, which will allow us to further interesting opportunities beyond the planned 8 interventions.

IV. At least 6 credible RIs expressed their willingness to collaborate with the project and to allocate resources for this purpose

Expressions of Interest have been received from 18 different research institutes. In the contracted and planned interventions we anticipate working with at least 9 different research institutes and of the contracted interventions we already have in place 6 different research institutes (University of Mataram, University of Jember, University of Brawijaya, Jember Polytechnic, Indonesian Sugar Research Institute (P3GI), Trunojoyo University).

All research institutes are allocating resources to project interventions. This is in the form of contributed salaries, use of research facilities and infrastructure. For the four interventions in place, this co-investment from research institutes is in the range of IDR 500M to IDR 1.2Bn, with an average of around IDR 900M.

V. An Annual Progress Report, and annual Work Plan complying with guidelines of AIP-Rural, is completed.

This report constitutes with the process of Semester Reporting required by AIP-Rural and it includes an Annual Workplan.

VI. An "in place" or preparatory audit has been conducted by a DCED accredited auditor

It was agreed following a discussion with the AIP-Rural senior advisor that a prepatory audit was (a) premature given only a few interventions are in place and (b) beyond the needs of ARISA given its relatively modest size and limited number of interventions.

Instead it was agreed to undertake a "document review". This has been done by a DCED Auditor (Hans Posthumus) and reported on in the DCED section of the report (above).

VIII. One study aimed at policy makers which identifies significant opportunities for RI-PS collaborations is conducted and shared with public officials.

See Section 7 (a) above.

X. A credible plan with budgets, indicators and personnel demonstrates how and when project outcomes will be achieved is prepared and approved by the AIP-Rural Secretariat inception report, complying with AIP-Rural guidelines is completed and approved by AIP-Rural's Secretariat.

To be completed – checking with Rani

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 2 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 2. 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	There has been a change in leadership in BPPT, with a new Deputy Chairperson, Dr. Eng. Eniya Listiani Dewi, taking up her role in October 2016. This will require effort in establishing a good relationship with the new

operations with the Government of Indonesia and Research Institutes	Deputy Director to ensure ongoing smooth sponsorship from BPPT. KPSG contracting issues identified in the last Semester report have been resolved but it has meant a significant delay in recruitment in the Indonesian office.
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 six interventions in place or nearing finalization. The incentives within Universities are not well aligned to partnering with the private sector and this sort of constraint in the innovation system will be examined by ARISA.
Private local investors are not attracted to join the interventions.	There is good private sector interest and involvement in all the interventions progressed to date. While the first few interventions have strong research institute champions, the next three have stronger private sector interest.
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 a minimum of 1000 smallholder farmers each with an expectation that there would be copying and crowding in through time. It is anticipated that there will be more than 1000 farmers actively participating in interventions by June 2016.
The development agenda of DFAT and AIP-R overrides the research for development agenda of CSIRO and the Indonesian Innovation Systems	DFAT remains strongly committed to ARISA, noting that it is still reasonably early in the project.
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 will fail and managing the negative consequences of that for smallholders needs to carefully considered. This is a particular risk in the 2015-16 rainy season because of the strong El Nino event. ARISA is working with the various interventions to explain the risks in an El Nino year and to try to develop mitigation strategies.

10. WORKPLAN FOR NEXT 12 MONTHS

Table 3. Workplan for the period January 2016 – December 2016.

	Month 1-6	Month 7-12
Overall Program Management	• Second Milestone Report (as part of Semester Report) delivered to DFAT • Internal review of project operations and Operations Manual • Recruitment of Intervention Manager, Measurement and Monitoring Coordinator • Preparations and participation in SRP meetings • Review of private sector engagement by international consultant and implementation of recommendations	• Second Milestone Report (as part of Semester Report) delivered to DFAT • Internal review of project operations and Operations Manual
Intervention Management	• Progress in implementation of the first four interventions, including any change management needed following the first set of milestone reports, capturing of lessons learned, and general troubleshooting. • Brokering and start-up of the second four interventions, to give a portfolio of eight. • Investigation of potential to link with PRISMA for the testing of emergent innovations, through small scale interventions. • General engagement with the private sector for the testing of emergent innovations, through small scale interventions.	• Continued implementation of eight interventions, including any change management needed following the first/second set of milestone reports, capturing of lessons learned, and general troubleshooting. • Start-up of 1-2 small scale interventions for emerging innovations, based on engagement with PRISMA and/or private sector linkages.
PCC	• PCC meeting with a focus on reviewing overall progress and implementation of final interventions • First BAST report completed	• PCC meeting reviewing MTR recommendations and implications for ARISA • Visit two interventions
Results Measurement & Learning	• Baseline studies completed for a further two RI-PS interventions • Impact projections completed for the first two RI-PS interventions • Scaling strategies completed for the first two RI-PS interventions • Implementation of findings from the Document review conducted by DCED consultant • Review to determine whether diffusion approaches are likely to achieve target numbers of farmers	• Baseline studies and impact projections completed for remaining interventions
Research and Capacity Building	• Capacity building in gender and ethics and partnership training for four interventions	• Reflections workshops on RI-PS partnerships in first four interventions

	Month 1-6	Month 7-12
	• Baseline data collection on innovation drivers in RIs and PS partners • Centre for Innovation in Policy and Governance commences innovation systems data collection • Data collection in in economics/value chain research in two targeted interventions • Technical inputs to interventions	• Revisit RIs for data collection on innovation systems • Report from CIPG • Data collection in in economics/value chain research in two targeted interventions • Technical input to interventions
Communication	• ARISA portion of AIP-Rural website fully operational following AIP-Rural website initiation in February 2015 • First four two-pagers on individual interventions completed (English and Bahasa) • "Human-interest" short stories drafted on first two RI-PS partnerships and uploaded onto AIP-Rural website	• Two public outreach activities held relevant to two RI-PS interventions • Second four two-pagers on individual interventions completed (English and Bahasa)

Appendix 1. Economic analysis of IPM in the Pilot Study

Economic Analysis of IPM on Dry Season Shallot in Probolinggo and Pare

Analysed by Joko Mariyono

Practical IPM technology on shallot has been introduced to farmers in Probolinggo and Pare. There were three farmers in Probolinggo and four farmers in Pare interested in the IPM. They provided half plot of shallot farming to be applied with IPM technology. For comparison, farmers applied usual practices to half of plot.

IPM practice use *Baccilus turingiensis* (BT) and selected insecticides that compatible to IPM. The selected insecticides are 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. In IPM technology, farmers needed to do hand-picking of insect pests both for egg mass and larvae.

Farmers' practices used mixed (cocktail) insecticides which are mostly incompatible to IPM technology since those insecticides 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 IPM technology results in lower net income, then farmers will get compensation. The compensation is the difference between net income of IPM technology and that of farmers' practices.

To understand the superiority of IPM technology, economic analysis was conducted to convince farmers. Economic analysis was conducted using partial budgeting approach, where only different factors from control were analyzed. In this study, only cost 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:

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

where $\Delta\pi$ = additional profit comparable to farmer practices, R_{IPM} = Revenue of IPM technology; R_F = Revenue of farmer practices; C_{IPM} = cost of IPM technology; C_F = costs of farmers' practices. The economic analysis was based on prevailing prices of insecticides and harvest. Average price of insecticides was applied since farmers use more than two insecticides. The price of BT used the local price. The results of analysis are presented below.

Table 1. Number of spray, insecticides per spray and hand-picking

Site	Farmers	Farmers' practices			IPM Technology		
		Spray	Insecticides	Hand-picking	Spray	Insecticides	Hand-picking
Probo-linggo	Arief	35	5	0	6	1	8
	Warno	33	4	0	9	1	8
	Nur	30	5	0	9	1	8
Pare	Agus	35	5	15	11	1	30
	Mukhlis	35	5	15	11	1	30
	Suyadi	35	6	15	11	1	30

Sunaryo	20	5	5	7	1	10

Table 1 shows that IPM technology technically superior to farmers' practices in terms of number of sprays and number of insecticides per sprays. But, IPM technology needs additional action, i.e. hand-picking to control insect pests mechanically. However, farmers in Pare also still needed to do hand-picking despite higher number of sprays and insecticides.

Table 2. Costs, revenue and profit

Site	Farmers	Farmers' practices			IPM Technology		
		Costs	Revenue	Profit	Costs	Revenue	Profit
Probo-linggo	Arief	1,625,000	950,000	-675,000	556,000	3,000,000	2,444,000
	Warno	1,425,000	3,500,000	2,075,000	631,000	3,500,000	2,869,000
	Nur	1,500,000	3,500,000	2,000,000	631,000	3,500,000	2,869,000
Pare	Agus	2,105,000	3,920,000	1,815,000	1,385,000	3,500,000	2,115,000
	Mukhlis	2,105,000	6,800,000	4,695,000	1,385,000	6,800,000	5,415,000
	Suyadi	2,255,000	8,500,000	6,245,000	1,385,000	8,032,500	6,647,500
	Sunaryo	1,410,000	0	-1,410,000	645,000	0	-645,000

Table 2 shows that the costs of farmers' practices were consistently higher than that of IPM technology. But, the revenue of farmers' practices and IPM technology was almost similar. Note that Sunaryo's farm did not harvest for both plots, thus both plots had no revenue. The profit of IPM technology was consistently higher than that of farmers' practices. This means that IPM technology was more profitable that farmers' practices.

Table 3. Profit comparison

Site	Farmers	Profit		
		IPM Technology	Farmers' practices	Increase
Probo-linggo	Arief	2,444,000	-675,000	3,119,000
	Warno	2,869,000	2,075,000	794,000
	Nur	2,869,000	2,000,000	869,000
Pare	Agus	2,115,000	1,815,000	300,000
	Mukhlis	5,415,000	4,695,000	720,000
	Suyadi	6,647,500	6,245,000	402,500
	Sunaryo	-645,000	-1,410,000	765,000
Total		21,714,500	14,745,000	6,969,500
% change				47%

Table 3 shows profit comparison between IPM technology and farmers' practices. On average, by implementing IPM technology on shallot, the profit can increase by 47%. The profit mostly comes from reductions of costs related to insecticide use.

Appendix 2. Preliminary findings DCED Compliance ARISA - 20th November 2015

This short report summarizes the assessment and support provided by Hans Posthumus (September 2015 to date) to ARISA/CSIRO to assess in how far ARISA's Monitoring and Results Measurement (MRM) system complies with the DCED Standard, and recommend steps in increase compliance.

1. Activities

- Reviewed the draft guide that details the MRM system
- Reviewed results chains, indicators, measurement plans and activity plans for 2-3 grants (beef, maize, cassava)
- Provide feedback via several mails and skypes with the MRM lead
- Held two telcons with management and home-based researchers

2. Findings

2.1. Framework

2.2. The concern initially expressed that it will be challenging for ARISA to comply with the DCED Standard has been discussed. Although the objective for ARISA might be slightly different from market development projects, there is no reason why ARISA should not be able to develop a MRM system that complies with the DCED.

2.3. The grants can be monitored and results measured (including at target beneficiary level – outreach and income changes) like any other market development intervention.

2.4. The 'additional' learning in terms of measuring improved partnerships and the system innovations (to learn and disseminate) will be included in the MRM system: defining indicators that reflect those changes, and develop plans and actually assess them.

2.5. The assessment will thus make use of the actual assessment of changes in the intervention results chain, from activity to impact level each semester, as done in other market development programs. This should be the responsibility of the MRM lead.

2.6. This assessment will then also provide input for a more in-depth (and participatory) assessment of the 'partnership and innovative model'. This is not so much 'a different system' but more 'a complimentary in-depth assessment'. This should be the responsibility of the Capacity lead.

2.7. Results chains (and indicators and MRM plans) for each of the grants should reflect 'both type of expected changes'. Assessments (and learning and dissemination) for the partnerships and system innovations will thus be based on the findings of the grants (individually and as a group). The later is best reflected in an overall program results chain.

2.8. Intervention level MRM design

2.9. Developing results chains helps to define the intervention better, is pretty intensive and is improving. The same applies to the list of indicators and measurement plans.

2.10. A more detailed assessment will take place later, but there might still be some issues in terms of level of detail of the results chain, the number and definitions of the indicators, and the plan to measure them (partly base- and end-line surveys, but also monitoring changes in the early stages of the intervention).

2.11. They are not perfect yet, but they are good enough (if feedback leads to improvements) for the moment (beef, maize, cassava-under development). It is

recommended to start fleshing them out, and to start with the field work (monitoring, attribution methods, baselines, etc.)

2.12. Further developing them, will identify how realistic the plans are. There are concerns in how far the partners (PS and RI) will be able to perform, as well as concerns on the MRM capacity within ARISA.

2.13. One issue not yet covered in the MRM plans, is the attribution methods that need to be defined before embarking on baseline plans. Guidance is provided at the DCED website.

2.14. At the same time, ARISA should ensure that the draft guidelines (fleshing out the details so it becomes more operational) are finalized.

2.15. Partners' MRM capacity

2.16. It is assumed that PSP and RI will monitor and provide data. This is probably feasible for data the partners should monitor and assess anyway (as a core activity of proper company management), yet ARISA probably needs to guide them and ensure the quality of the data collection. It is unclear in how far all partners have the capacity to do so.

2.17. Data collection at target beneficiary level is likely to be a combination of data provided by the partner, and data collected by ARISA (or outsourced to a research firm). The assessment remains a task for ARISA that can't be delegated or outsourced.

2.18. The above will absorb lots of time from the MRM lead. It is thus also key that all staff (Surabaya based staff and home based researchers) share the same MRM system, to avoid that individual researchers develop 'islands' and demand additional data collection from the PSPs and RIs.

2.19. ARISA's MRM capacity

2.20. The team in Surabaya is lean. MRM must be integrated in program management, and the resident team leaders' role is to ensure that all staff members play their role in MRM.

2.21. There are concerns if one MRM lead is sufficient to ensure that MRM is being done properly. An assessment of the needs and capacity of all tasks (including MRM) based upon a detailed roles and responsibilities matrix is ongoing.

2.22. Once completed, solutions must be found to address the likely gap between needs and (human and financial) resources. It is likely that one MRM lead is insufficient. One option is to add one more person, and analyze how the MRM tasks are best shared between them: splitting grants, or each specializing on tasks for all grants.

2.23. Assess the need for further capacity building with respect to MRM, at partner level (PSP and RI), as well as within the team (manager, MRM staff). Resources listed on the DCED Websites

3. **Next steps:**

3.1. Finalize the cassava intervention MRM plans
3.2. Define attribution methods for the 3 interventions
3.3. Develop research plans for the 3 baseline surveys
3.4. Finalize the R&R matrix
3.5. Address the resource gap
3.6. Finalize the manual
3.7. Build the capacity of the team in MRM

20th November 2015 - Hans Posthumus

Appendix 3. Practice Note on applying the DCED Standard in ARISA.

Applying the DCED Standard to an Innovation Systems Project

Challenges and lessons in setting up an effective MEL system that meets the DCED Standard in an innovation systems project comprised of partner-led interventions

Introduction

This practice note shares the experiences of attempting to design an effective monitoring, evaluation and learning MEL system that also meets the DCED Standard for a complex project involving partner-led interventions working to catalyze innovation between the private sector and research institutions (RI's) in Indonesia. It is written from the perspective of the ARISA Results and Engagement Manager who is trying to implement the DCED Standard for the first time.

About the project

The Applied Research and Innovation Systems in Agriculture (ARISA) project falls under the Australia-Indonesia Partnership for Rural Economic Development (AIP-Rural) programme. It is funded by the Australian Department of Foreign Affairs and Trade (DFAT) and implemented by the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO).

The ARISA project aims to increase the income of 10,000 smallholder farmers in Eastern Indonesia in four years, via eight interventions. Each of the eight interventions are managed by local research institute and private sector partnerships that collaborate to strengthen local innovation systems via the dissemination of agricultural technologies to farmers. Capacity building, backstopping, support and guidance are provided by CSIRO to the research institute-private sector project teams, and CSIRO itself conducts collaborative, adaptive research on these interventions in the areas of household economics, scaling up, innovation systems and partnership building to draw broader lessons for governance on how to enable agricultural innovation through public-private partnerships.

About the project team

Most other recent CSIRO research projects have not had a monitoring and evaluation manager; none have ever implemented the DCED Standard within their projects. The Results and Engagement Manager is responsible for setting up an MEL system that meets the DCED Standard, but she also has never had experience with implementing the Standard. Moreover, the project itself is designed differently from the typical CSIRO research models, as it is more adaptive, focused on innovation systems and impact driven. In this sense, ARISA is very much a learning experience for everyone involved, and has resulted in co-development and

redefinitions of the project as it has evolved. These changes have in turn been reflected in changes in the MEL system over time.

Experimenting with DCED

Understanding how to set up an MEL system that complies with DCED

ARISA's understanding of what it is as a project has evolved, and is still evolving, over time. The description in the previous section of ARISA reflects the latest understanding of what the project trying to achieve and how it attempts to do this.

DCED itself was originally designed for larger projects that were focused primarily on measuring impact within the lifetime of the project, especially impact around income increases and outreach scale to target beneficiaries. While ARISA is concerned with income increases and outreach scale to farmers through the individual interventions, the overall goal of ARISA is to begin moving toward higher-level systemic change by developing more functioning innovation systems. In this sense, the process of implementing the interventions serve more as research subjects to be analysed for the purpose of developing insights for catalyzing change. These insights would in turn help inform policymakers on how agricultural innovation can be better supported, rather than the income and outreach impacts from the intervention being the only focus of the project.

Originally, the general approach was to try to implement DCED as the MEL system for the interventions, and think of each of the CSIRO research components separately. With this in mind, the MEL Manager set out to develop DCED business models, results chains and indicators with two initial interventions, both of which were driven by the research institutes rather than the private sector. While the process was very helpful for the project teams articulating the chain of logic for activities management, it resulted in results chains that needed significant further refinement. This process also revealed that conducting the workshops in the local language were critical for drawing out participation from key partners, particularly the private sector in these interventions, who often had a weaker grasp of English and had been less involved in the project design than the research institutes. Sensitivity to power dynamics in the room were important here, and it would have been helpful had the decision-makers in the private sector and research institutes been present, as this was not always the case for the private sector in these workshops.

Attempting to integrate DCED with innovation systems and partnership capacity building approaches

The results chains for the interventions led to concerns from some members of the ARISA team regarding the lack of "process" or "institutional" indicators within the results chains. This led to the development of a new, innovation systems-based project theory of change, which helped

guide changes in the results chains and indicators. In this sense, the project teams, which were focused on their specific interventions, could understand what kinds of institutional changes ARISA wanted to enable within those interventions without overwhelming them with the scientific thinking behind innovation systems.

After refining the results chains and indicators, there was a general consensus within the ARISA team that DCED should not be the sole guide for the MEL system. The learning process throughout this was how to make DCED useful to ARISA, and how to capture other elements needed for an effective MEL system beyond DCED. The latest result of this thinking has been embedding capacity building and institutional changes within the results chains in as far as they are relevant to the project teams.

The development of DCED results chains, activity plans and indicator/monitoring plans

Following the results chains, ARISA worked with the research institute-side of intervention teams to develop activities and monitoring plans. Each of these discussions were productive not only in producing guiding documents for project implementation and M&E, but also for engendering discussions on new ideas and thoughts that emerged throughout these processes. In the context of discussing specific activities and through the rigorous planning required by DCED, it was much easier to challenge traditional ways of thinking within the research institutes, facilitating them into thinking about "innovation systems," "market systems" and institutional processes as critical elements to project success. Without concrete project issues to discuss, it would have been extremely difficult for the teams to realize the relevance of those concepts for the design and management of their interventions.

It should be noted here that the activities plan was an adaptation of the Summary of Supporting Research example from DCED, which made explicit the evidence and assumptions behind each of the intended changes within the results chain. The original DCED suggested template was not particularly useful to ARISA, and this adapted activities plan created much more clarity around (1) how to integrate ARISA capacity building activities with the intervention team's activities, and (2) the timeline of activities to guide the development of the monitoring plan.

However, in trying to coordinate the activities and monitoring plans with the rest of the CSIRO team following the discussions with the research institutes, it became apparent that some decisions needed to be made regarding resourcing, as time allocations, limited staff resources and budget for the overall project needed to be aligned with the expectations around what ARISA should achieve.

Overall, the meetings with the partners around developing the business model, results chain, activities plan and monitoring plan created a more effective activities management framework. A key lesson here was the importance of facilitation and preparation by the MEL manager before these structured meetings, as it would have been unrealistic to expect project teams to complete these documents on their own. Another important takeaway was the necessity of up-

front intensive staff and time resources, both from the CSIRO side and from the research institute partners, in order to both meet the DCED Standard and take an innovation systems approach. The level of capacity building resources with such expectations largely exceeds what is traditionally present in the more linear delivery model of traditional project models.

DCED as a guide for project management and a tool for learning

Because DCED was originally designed with the Markets for the Poor (M4P) market development approach in mind, the understanding, buy-in, and integration of the underpinning market development concepts by project management are important for a DCED-compliant MEL system to function properly. DCED is designed not just for monitoring and evaluation, but for learning and improving project management. For example, during the process of drafting results chains and sustainability indicators for an intervention on beef cattle, it became clear to both the Results and Engagement Manager as well as the RI through the results chain that as part of the intervention design, the identification and development of a new market player for establishing forage was needed to replace this role initially played by the research institute. The Standard is helpful for providing tools to track whether or not the interventions are taking a market systems approach, as it is designed to inform key management decisions—this is where the rigour and resource requirements of the process pay off in terms of improving project results.

The major difference between a DCED-compliant project and traditional projects is that in the latter, M&E is separated from project management (the responsibility of the M&E team) and provides limited "learning" and guidance to management. DCED is not really an M&E system, but a MEL *plus project management* system, integrated into one.

Key learnings

1. The DCED Standard does not provide all the answers for developing an effective MEL system for innovation systems and needs to be tailored, especially for projects with smaller resources. For example, the *underlying principles* of DCED of adaptive learning, testing assumptions, and managing in a way that is iterative and data-driven should be fully understood and embedded in systems by the team.
2. Aside from improved accountability to donors, the DCED Standard is a tool for behavior change within organisations. It has already challenged the ARISA team to think about MEL and project management differently, and offers concrete guidelines for fostering a learning culture within both the ARISA team and within the research institute partners.
3. Certain parts of the DCED Standard provide a useful framework for improving intervention management by partners by forcing the research institute teams to think through management issues early on (e.g., results chain/activities plan, sustainability, scaling models), and it also becomes a key vehicle to build capacity on fostering institutional change and innovation systems when integrated properly. Other elements

of the DCED Standard (e.g., their definition and suggestions around systemic change) have so far been less relevant to ARISA.

4. Each intervention needs an active M&E coordinator within the research institutes, ideally with previous M&E experience. It would have been good to convey this at the start of our engagement with each of the partner, as many of the grant partnerships either do not have this resource or have had to bring some-one onboard, sometimes grudgingly as resources are limited.
5. More capacity building related to making key changes happen within the results chains would have been helpful prior to or during the development of intervention proposals, including on participatory approaches for farmer engagement, how to develop market systems, scaling and the research that should have underlain each of the intervention results chains.

Appendix 4. Document prepared for Syngenta on current El Nino event

Preparing for the 2015 El Nino in Indonesia

What is El Nino and the developing 2015 El Nino event

Indonesia, and particularly eastern Indonesia, is affected by the occurrence of El Nino and La Nina climate events. El Nino events occur when changes in atmospheric circulation patterns and ocean currents result in sea surface temperatures in the eastern equatorial Pacific being much warmer than normal. This usually results in higher than normal rainfall in the eastern Pacific and lower than normal rainfall in the western Pacific. This can cause drought conditions in the region, and in particular eastern Indonesia and eastern Australia. From 1877 to 1997, 93 percent of the drought years in Indonesia have been linked to El Niño events. However, not all El Nino years result in droughts so guidance must be placed in the context of risk management.

A severe El Nino event has developed during 2015 and it is now getting closer to the strength of the very significant El Nino that occurred in 1997-98. Various meteorological agencies and institutes around the world (USA, Korea, Japan, Australia) produce seasonal rainfall forecasts based on the developing ocean and atmospheric patterns and Figure 1 shows the latest forecast from the International Research Institute at Columbia University in the USA. It shows the probability of receiving normal rainfall for the months October to December, which is the start of the rainy season. The forecast indicates there is a 70% chance of receiving below normal rainfall in eastern Indonesia.

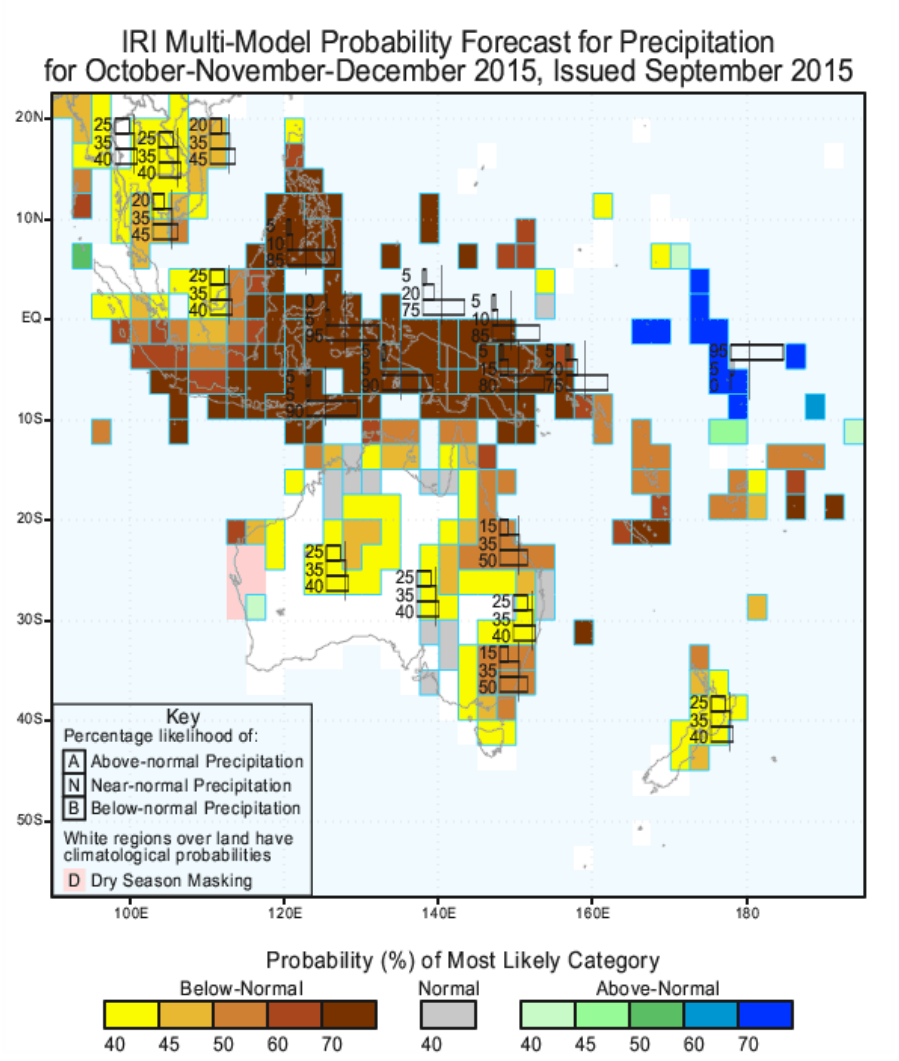

Figure 1. Probability of receiving normal rainfall for the months October to December 2015.

Impacts of El Nino

El Nino events can have a significant impact on agriculture and forestry. The severe 1997-98 El Nino caused a serious shortfall in national cereal crop production as a result of a severe reduction in crop yield per ha as well as a decline in the area planted. The delayed onset of early season rains meant that the rice crop harvest was delayed by 2 months with flow-on consequences for the following crop in 1998. The reduced rice production, coinciding with the economic crisis which began in 1997, led to a 300 percent increase in the price of rice. The Government imported over five million tons of rice to maintain price levels and to ensure the availability of food to the more vulnerable communities. On 23 April 1998 the Director-General of FAO approved jointly with the Executive Director of the World Food Programme an Emergency Operation for US$ 88 million for 4.6 million most affected people in Indonesia.

Similar negative impacts on yield were also evident in other crops in 1997-98 and with a shortage of forage, many livestock were slaughtered early which led to sharp reductions in price in response to a short-term oversupply of meat. In forested areas, there were severe wildfires with the smoke haze causing problems throughout South-East Asia.

Strategies to reduce the impacts of El Nino on agriculture

There are a number of strategies that can be used to lessen the impacts of drought but the negative impacts can never be completely mitigated.

1. Change crop species

One way of managing reduced water availability is to change the crop species being grown. For example in dryland agricultural regions a shorter season crop such as mung bean could be used to replace maize which needs a 4 month period of growth. In an El Nino event it is typical for the early wet season rains to fail but the monsoon season can be close to normal so there can be adequate rainfall to grow a short season crop that is planted in December or January.

2. Reduce area planted or planting configuration

A strategy that is used in some regions of the world is to widen row spacing of crops so that plant roots can exploit more of the soil volume to access adequate moisture. More attention may need to be paid to weed management with this strategy as there will be more space and light for weeds to grow. Alternatively, risk can be managed by reducing the area planted to crop and planting a forage species in the remaining area to provide at least some forage for livestock and have a farm product that is not dependent on producing a grain or seed.

3. Reduce the level of nutrient and other inputs

Under normal crop growing conditions, much of the fertiliser is applied at the time of planting. An effective “no-regrets” strategy in an El Nino is to apply less fertiliser at planting and only re-apply more fertiliser as rainfall is received. This can result in a significant saving in input costs in drier than normal years. There may also be less of a need for other inputs such as herbicide if conditions are drier than normal.

4. Better managing irrigation water or opportunistically sourcing supplementary water

In irrigation areas, where there is a risk irrigation water supplies will be constrained it can be feasible to plant another crop that only needs supplemental water. For example, there may not be enough

water to grow paddy rice but there is still some irrigation water available. In this scenario, it may be better to plant a maize crop which is partially irrigated. That strategy provides greater certainty of achieving a harvestable crop. It is worth noting that in the 1997-98 El Nino, there was nearly 300,000 ha more maize grown than normal as farmers switched from paddy rice to maize in response to the dry conditions.

In regions where groundwater is available at shallow depths, it may be opportunistic to dig wells and pump water to provide additional irrigation. The costs of establishing shallow wells and operating pumps can be a cost-effective way of achieving some crop yield, especially if there is upward price pressure on cereal crops as a result of a national reduction in crop yield.

Appendix 5. Draft terms of reference for CIPG engagement.

Assignment: Development of an influence map to guide engagement and dialogue with champions of institutional and policy reform to enable agricultural innovation at the public-private sector interface.

Background

Applied Research and Innovation Systems in Agriculture (ARISA) is a program funded by DFAT, and implemented by CSIRO that seeks to enable agricultural innovation at the public-private sector interface in ways that have direct impact on smallholder farmers. The program is structured around up to eight pilot interventions. Each intervention is a pilot partnership between one or more public research institutes and one or more private sector companies. The pilots are focused on innovation opportunities. These might be an opportunity arising from a technological breakthrough where the private sector can play a role in creating the conditions needed to deliver this technology or the market conditions needed for farmers to use it. Alternatively it may be market opportunities identified by the private sector where research and technology support can help exploit this opportunity. The eight interventions are being implemented by local research institute and private sector partnerships. Intervention management, capacity building, technical and other support and guidance are provided by CSIRO to the research institute-private sector project teams. CSIRO also itself conducts collaborative, adaptive research on these interventions in the areas of household economics, scaling up, innovation systems (understanding institutional dimensions of the innovation process) and partnership building to draw broader lessons for institutional and policy development on how to enable agricultural innovation through public-private partnerships.

ARISA recognizes that in order to stimulate wider institutional and policy development in the innovation systems (and the scaling effects this implies) it needs to engage stakeholders in the policy community in meaningful dialogue on the experience of ARISA and in particular the lessons emerging from this for institutional and policy reform. However developing an effective mode of engagement and dialogue is challenging with out an understanding of the champions, dynamics and politics of the policy system in Indonesia. This is particularly challenging for external projects and researcher as they may not be alert to and aware of the nuances and power dynamics in relevant policy process domains.

The purpose of this assignment is to develop of an influence map to guide engagement and dialogue with champions of institutional and policy reform to enable agricultural innovation at the public-private sector interface. Specific tasks are as follows:

1. Provide an overview of the political economy of policy and institutional change processes in relation to enabling agricultural innovation at the

public-private sector interface. In particular highlighting the dynamics and drivers of policy change processes and the critical champions.

2. Provide an overview of existing schemes and mechanism that are targeting enabling innovation agricultural innovation at the public-private sector interface (business incubators, innovation parks etc). In particular provide a commentary on the strengths and weakness of these mechanism, potential complementarity to ARISA and identify key champions who could help advance experience emerging from ARISA.
3. Based on #1 and #2 develop options for an engagement or dialogue strategy/ mechanism. In addition to outlining key policy players and processes that ARISA should engage with, it would also be valuable to make suggestions about an Indonesian organization that ARISA could partner with in orchestrating the suggested options. This should be considered from a sustainability perspective beyond the life of ARISA.

It is anticipated that this scoping study will involve desk based reviews of existing studies and reviews as well as interviews with key stakeholders. The duration of the study is anticipated to be 3 months. The fee will be AUD$ 20,000.

CSIRO Social Science Human Research Ethics Committee Application Form

Information for applicants

The criteria that CSSHREC will apply to your application are contained in the National Statement on Ethical Conduct in Human Research (2007). Applicants should ensure that they have read the National Statement and that the application is consistent with the *Commonwealth Privacy Act, 1988*.

Once completed, the application form should be saved and submitted with any supporting documentation, by email to csshrec@csiro.au. Supporting documents may include:

- Information sheets, telephone scripts, advertisements, web pages that will be used to recruit or provide information to participants about the project;
- Consent forms;
- Surveys, questionnaires or other data collection instruments that will be used to collect information from participant groups;
- Letters of support from community authorities or relevant organisations and;
- Copies of any documentation related to a previous non-CSIRO ethics review of the project.

The receipt of all applications will be acknowledged in writing.

Remember: the existence of potential ethical issues does not necessarily mean the research is not permissible – show in your application how the research can be done in an ethical manner and minimise risks to participants.

Office Use Only

Reviewed at CSSHREC Meeting on:_____

CSSHREC Decision

❑ Project approved for the following period:_____

❑ Approval with routine conditions:

❑ Approved with special conditions

❑ Not yet approved (resubmission required)

❑ Not approved. Reasons:

Signed:_____Date:_____
(CSSHREC Chair)

Applicant notified:_____Date:_____
(CSSHREC Executive Officer)

CSSHREC Application Form

Section 1: Project Title and Summary

1.1 Project Title:

Increasing the incomes of smallholder sugar cane producers in Madura, East Java, through improved market linkages, the commercialisation of agricultural innovations, and an enabling policy environment.

1.2 Provide a brief *[no more than 250 words]* plain language description of the project.

The Indonesian government has prioritised sugar production, with the aim of self-sufficiency in sugar production by 2019. Madura has significant potential for the development of smallholder sugarcane, particularly on large areas which are currently under-utilised and/or are used to produce tobacco.

The project aims to work with smallholder farmers, the Indonesian Sugar Research Institute (P3GI), the sugar milling company PT Perkebunan Nusantara X (PTPN X), Trunojoyo University, and relevant Dinas of East Java Province to achieve six objectives:
- Improve market linkages for smallholder producers through direct contracting with PTPN X to ensure a minimum market price and also support for acquisition and use of agricultural inputs;
- Increase rainfed sugarcane production and profitability through targeted initiatives to develop and disseminate a range of agricultural innovations designed to increase yields and incomes;
- Determine the feasibility and potential of irrigated sugar cane cultivation through studies on the social, cultural, hydrologic, edaphic and environmental issues surrounding water governance;
- Scale up irrigated and/or rainfed sugarcane production;
- Investigate the feasibility of land grouping and mechanisation to enable producers to take advantage of economies of scale;
- Review the overall impact of the project, and develop a long-term strategy and an enabling policy environment.

The project aims to benefit smallholder farming families in eastern Indonesia by developing and disseminating a range of agricultural innovations to increase their incomes and improve their welfare. It is anticipated that by November 2018 the project will reach more than 2,000 farming families.

1.4 Project Location(s): Madura Island, East Java

1.5 Proposed Start Date: 01/01/2016 Proposed Finish Date: 30/12/2018

Section 2: Project Details

2.1 Describe *[no more than 1000 words]* the project aims, the methods used to achieve those aims and the research question(s) or hypotheses being explored.

Sugar is one of the Indonesian government's priority sectors, with the goal of self sufficiency in sugar production by 2019, in order to supply a strong and growing domestic market. Indonesia produces plantation white sugar from sugarcane, which is primarily used for direct consumption.

Many of the current smallholder sugarcane production areas, especially in Java Island, are subject to competition from a range of other high value crops and different types of land use. Typically, the land available for the production of sugarcane is becoming smaller and increasingly fragmented, particularly in East Java. However, Madura Island has significant

potential for the development of smallholder sugarcane because of sufficient land availability and a range of other comparative advantages.

There are large areas of under utilised agricultural land available in Madura which has potential for sugarcane production, including areas where tobacco is currently grown as the main cash crop. Adequate infrastructure is available, particularly the road network and transportation links to the mainland of East Java across the new Suramadu Bridge. The area of land that is potentially suitable for sugarcane production in Madura is approximately 125,000 ha, relative to a total of about 460,000 ha currently planted throughout Indonesia.

PT Perkebunan Nusantara X (PTPN X) is a state owned company supported by the Provincial Government of East Java. It is highly committed to the development of smallholder sugarcane in Madura. PTPN X is the company that manages the sugar factories closest to Madura for the current processing, and in the longer term it has plans to build a new sugar factory in Madura, but an increased production of sugarcane by smallholders on the island is necessary for this to happen.

This ARISA project involves collaboration between the company PTPN X and the Indonesian Sugar Research Institute (P3GI), with the company leading the development of sugarcane in Madura. P3GI will take the lead on developing new agricultural innovations such as new sugarcane varieties, improved fertiliser and water management and the potential for land grouping to facilitate mechanisation of harvesting. This will involve both demonstration plots and participatory research approaches with smallholder farmers.

The overall goal is to increase the incomes of smallholder sugarcane producers in Madura through improved market linkages, the commercialisation of agricultural innovations, and an enabling policy environment.

2.2 Describe *[no more than 450 words]* the theoretical or conceptual basis, and background evidence, for the research proposal, e.g. previous studies, anecdotal evidence, review of literature, prior observation.

Sugarcane is produced on Madura island in rainfed systems: current yields are around 40t/ha, compared to a national average of 70t/ha. There is potential to develop smallholder sugarcane on Madura further as there is sufficient land available and adequate infrastructure to process and transport cane within Madura and to the East Java mainland.

To maximise sugar production and productivity a range of agricultural innovations need to be developed for and implemented by local communities. These include: improvements to water management and soil fertility; the use of improved plant varieties; increasing the scale over which sugarcane is produced; and irrigating cane fields. Incorporating irrigation into sugar production has the potential to increase yields as long as suitable water resources are available and they can be used in a way which is acceptable to local communities and is sustainable.

In 2013 P3GI and PTPN X conducted a collaborative technical and market assessment for the development of smallholder sugarcane production in Madura. They examined technical and market aspects of production, potential innovations to be developed, and the general relationship between PTPN X, smallholder farmers and other stakeholders. The review concluded with a series of recommendations on potential innovations to be developed and disseminated, appropriate communication strategies, and operational support necessary from PTPN X. In 2014 PTPN X facilitated a group of farmers, policymakers and other stakeholders to visit P3GI to learn about the range of potential agricultural innovations to improve sugarcane production on Madura. This project plans to build on these relationships and provide an opportunity to address many of the findings and implement the recommendations of the initial technical and market assessment from 2013.

PTPN X is a state owned company which is highly committed to the ongoing development of smallholder sugarcane in Madura. PTPN X has developed around 1,200 ha of smallholder sugarcane in Madura to date and is prepared to support (e.g. through minimum price contracts, provision of high quality inputs and knowledge transfer) increased sugarcane production on Madura.

Smallholder farmers will benefit from increased knowledge and skills around sugarcane production, increased production levels, and access to improved market linkages: these benefits are expected to increase farm incomes and improve the welfare of smallholder farmers. Calculations indicate that \farmers who currently grow sugarcane at production rates of around 40t/ha have negative gross margins (for this section of their production system) of about Rp 7.2M/ha. In the more efficient, productive system this project aims to help famers achieve, where yields are around 70t/ha farmers are estimated to have positive gross margins (for sugar production alone in their whole farm systems) approaching Rp 7.8M/ha.

Section 3: Researchers Details

Provide details for all researchers involved in the proposed project. Fields can be copied to include additional researchers or students as necessary.

3.1 Project Leader at research institute

Name: Ir. Triantarti
Organisation: P3GI
Position: Director
Address: P3GI
Country (if not Australia): Indonesia
Phone: +62 8 123316983 Email: traintarti@gmail.com

3.1.1 Summary of qualifications and relevant expertise

Qualifications: MSc

3.1.2 Describe the role of the chief researcher / investigator in this project

The Project Leader has overall responsibility for the delivery of the project objectives. This will involve working with researchers and extension agents from P3GI, PTPN X, Trunojoyo University, and relevant Dinas from East Java. He will be responsible for coordinating all project activities, solving any challenges as they arise, and arranging business activities and farmer institutions.

3.1.4 Please declare any general competing interests

3.1.4 If the project is being conducted across multiple sites name the site(s) for which this chief researcher / investigator is responsible.

The project will be conducted in on multiple farms on the island of Madura, East Java.

3.1.5 Is this person the primary contact for this application? ☒ Yes ☐ No

3.1.1 Summary of qualifications and relevant expertise

Qualifications: SP

(Please copy fields to include additional researchers or students as necessary.)

See attached proposal which lists all 17 other researchers in the project. Their skills and roles in the project include sugar production, agronomy, plant breeding, socio-economic research, mechanisation, water management, and marketing and information and training

3.2.1 Summary of qualifications and relevant expertise

3.2.2 Please declare any general competing interests

3.2.3 Describe the researcher's role in this project and identify the sites where they will be conducting their research.

3.4 Other parties

3.4.1 Is it intended that other people, not yet known, will play a specified role in the conduct of this research project?

☐ Yes. ☒ No

If Yes, please describe their role in the project

3.5 Additional Certification and Training Requirements

3.5.1 Are there any relevant certification, accreditation or permit requirements relevant to the conduct of this research?

☐ Yes. ☒ No

If Yes, specify what is required and advise whether the principal researcher or any of the other researchers have the relevant certification, accreditation or permit.

3.5.2 Do the researchers / investigators or others involved in any aspect of this research project require any additional training in order to undertake this research?

☒ Yes. ☐ No

If Yes, what training is required and how will it be provided?

An important part of the project will be capacity building in managing and executing projects with multi-disciplinary teams, in managing partnerships, in monitoring and evaluation, and in building awareness of ethical approaches to working in partnerships and with smallholder farmers. This training will be undertaken as part of a two-day workshop on partnering, monitoring and evaluation and ethics. Michaela Cosijn with assistance from either Saediman Mboe (Indonesian researcher who we have contracted or Lauren Xie (ARISA Results and Measurement Manager who is fluent in Indonesian).

Section 4: Resources

4.1 How is the project being funded?
(*Include name of the funding organisation(s), the amount(s) of funding being provided and any in-kind support/ equipment being provided by an external party or sponsor.)*

The principal funder for the project is DFAT, through their AIP-Rural Program. They will be contributing $180,000 AUD to this particular project/intervention. In-kind support in the form of salaries of academic staff and from the private sector in guaranteed price margins amounts to over $125,000 AUD.

4.2 Are these resources sufficient for the project to be successfully completed?
☒ Yes. ☐ No

4.3 How will any funding shortfall be managed?

We have in the past experienced sudden losses of funding with DFAT funded projects associated with budget cutbacks at a whole of DFAT level. The project has been designed such that the scale out activities can be curtailed without compromising many of the applied research activities. Also, in ARISA we have some contingency budget built in and DFAT funding is somewhat in advance which provides an opportunity to more gradually and sensitively wind down projects if required.

4.4 Describe any commercialisation or intellectual property implications of the funding/support arrangement.

This project is not undertaking any new discovery research but rather it is applying known technologies. As such it is not envisaged there will be any commercialisable IP for either the research or private sector partners. Other research IP generated as part of CSIRO's research component of the project (e.g. Innovation Systems research) will be owned by CSIRO with rights given to DFAT to widely use the research results and output. As part of the contract between CSIRO and P3GI/PTPN X, IP ownership will be granted to P3GI with rights back to CSIRO to use the results and outputs from the research.

4.5 Are there any restrictions on the publication of results from this research?
☐ Yes. ☒ No

If Yes, describe these restrictions.

4.6 Does the funding/support provider(s) have a financial interest in the outcome of the research?
☐ Yes. ☒ No

If Yes, describe the interest.

4.7 Do you consider the funding/support arrangements to constitute a potential conflict of interest?
☐ Yes. ☒ No

If Yes, describe any potential conflict and how this will be managed.

4.8 Will any payment be made to researchers for the enrolment of participants in the project?
☐ Yes. ☒ No

4.9 Does any member of the research team have any affiliation with the provider(s) of funding/support, or a financial interest in the outcome of the research?
☐ Yes. ☒ No

If Yes, describe the affiliation(s) and/or interest(s).

4.10 Does any other individual or organisation have a financial or other significant interest in the outcome of this research?

☒ Yes. ☐ No

If Yes, indicate the interested party and describe the interest.

P3GI, PTPN X and Trunojoyo University will have significant interests in the outcomes generated through this project. For P3GI and Trunojoyo University this will be in demonstrating the impact of their research and application of technologies. For PTPN X this will be through larger scale production of sugarcane in the region which can be processed through their existing and planned factories.

Section 5: Prior Review

5.1 Peer Review

5.1.1 Has the research proposal, including design, methodology and evaluation undergone, or will it undergo, an ***independent**** peer review process?

[*please note independent peers are those NOT involved in the design, delivery or funding of the project and excludes internal review of the project by CSIRO staff]

☒ Yes ☒ No

If yes, provide details of the review (whether it was conducted by peers internal or external to CSIRO or both) and the outcome. *(A copy of the letter / notification, where available, should be attached to this application.)*

This project proposal was the result of an Expression of Interest process with short-listed EOIs invited to prepare full proposals (see full proposal as separate attachment). A selection panel comprising the Project Leader (Andrew Ash), Grants Manager (Rob Caudwell), Results and Measurement Manager (Lauren Xie) and an independent Indonesian scientist (Saediman Mboe) reviewed both the EOIs and full proposals.

If no, explain why it will not undergo an independent peer review process.

We believe the selection process was sound even though it had just one truly independent panel member. None of the other panel members had a direct interest in any of the project proposals submitted and scoring of proposals was done individually and comments collated.

5.2 Prior Ethics Review

5.2.1 Have you previously submitted an application for ethical review of this research project to any other Human Research Ethics Committee (HREC)?

☐ Yes ☒ No (go to 5.3)

5.2.2 If yes, provide details of these HRECs and the status/ outcome of the review process.

Name of HREC:

Status and outcome of this review *(provide a copy of any correspondence regarding the HREC's decision*). If the proposal was rejected or conditionally approved state why or what conditions were applied.

5.2.3 Explain why an application for ethical review was submitted to the above HREC/s

5.3 Future Ethics Review

5.3.3 Is it intended that this research proposal will be submitted to any other Australian or overseas HRECs?

☐ Yes ☒ No (go to Section 6)

5.3.4 If yes provide HREC details.

Name of HREC:

Scope of approval being sought from the above HREC e.g. for particular site or timeframe.

5.3.5 For what activities or sites where the research is to be conducted will CSSHREC provide ethical review?

Name of site(s):

5.3.6 Describe any time-critical aspects of the research project of which a CSSHREC should be aware.

Section 6: Project Risks and Benefits

6.1 Has this project been undertaken previously?

☐ Yes ☒ No

6.2 Does the research involve the use of a new and previously untested practice or intervention with the potential to create unknown impacts on participants or communities?

☒ Yes ☐ No

If Yes, describe the practice and how it differs from standard practice or interventions.

It is likely new sugar cane varieties will be tested as part of this intervention. While these varieties may not have been used previously in Madura it is not expected this will pose any risk as the varieties selected will be done so with the expectation that these varieties will be better suited to the Madura environment compared with existing varieties, resulting in higher yields of sugar cane.

6.3 What expected benefits (if any) will this research have for the ***wider community***?

The outreach target for this project is to have 2,000 smallholder farmers adopting project innovations by November 2018. The project itself is looking to have significant impact and it is anticipated that wider scale adoption will occur through processes of crowding-in and copying.

The project is also expected to have flow-on benefits for employment at the local level. It is an anticipated that additional jobs will be created related to additional sugar processing requirements at PTPN X factories. These additional jobs will relate to harvesting and transport of the cane to the mill and in sugar processing at the mill.

6.4 What expected benefits (if any) will this research have for ***participants***?

Smallholder Farmers
The project will improve the livelihoods and welfare of smallholder sugarcane producers in Madura island, East Java through increasing their incomes via improved production and productivity of sugarcane, increased market linkages and a three-year guaranteed minimum sugarcane price. Through sugarcane cooperatives, farmers will be empowered and the trust and solidarity of famers and farmer groups in the region will be increased.

Research Institutions
Through this project, staff from P3GI and Trunojoyo University will develop skills in designing, managing, monitoring and delivering on collaborative research projects and to respond to the demands of private sector partners. Underpinning this is the nurturing of a positive organisational culture that supports improved collaboration with the private sector as a way to drive genuine impact at scale for smallholders. Additionally, this project will optimise existing research infrastructure, such as laboratories and trial sites, as well as develop closer links to farmers, enhance student access to farmers, and stimulate some core operational financing from the public purse.

Private Sector
PTPN X will benefit by increasing the supply of sugarcane through their factory; the company plans to build additional processing facilities if sugarcane production on Madura is increased. PTPN X will be actively involved in the engagement of smallholder farmers so it is expected there will be some benefits for them in having better understanding of the constraints faced by smallholder farmers.

6.5 What risks (e.g. social, psychological, financial, physical or legal) will there be **to participants** as a result of **their participation** in this research project and how will they be negated/ minimised/ managed?

Risk 1 – Innovations adopted at farm level fail
There is a risk that the innovations when implemented with smallholder farmers do not lead to the expected benefits or might even lead to negative impacts, if sugar cane production does not return the yields necessary to match profit from existing farming operations. This risk will be mitigated by embracing an adaptive participatory research approach with smallholders and implementing a no regrets pilot testing of innovations. Before widespread uptake is advocated, risks will be discussed with participants and informed consent obtained.

Risk 2 – Private companies lose interest
PTPN X as buyer of sugarcane, has risks associated with the marketing and supply of sugar products, especially as it will enter into guaranteed purchase contracts with smallholder farmers. If there is a downturn in the sugar market value chains will be affected and this may lead to project failure. Given the current strong global demand for sugar, and the Indonesian government's stated desire to increase sugar production to achieve sugar self sufficiency by 2019 which is supported by government pricing mechanisms, it seems unlikely that PTPN X will lose interest in increasing sugar production from Madura. PTPN X has milling operations that draw in most of its sugar cane from mainland production areas so a failure in the production system on Madura is unlikely to have a significant negative impact on its existing mill operations.

Risk 3 – Research process on innovation and institutional capacity building misunderstood
A key aspect of the research component of this project is understanding the innovation process between the research institute partners, the private sector and smallholder farmers, as well as capacity building initiatives. This has some potential risks (social) if this research component is not well understood by the participants. Good communication in the early stages of the project and informed consent will mitigate these risks.
Risk 4 – Input supplies, especially fertiliser, not available when needed
Uncertain availability of inputs, particularly N fertilisers during the growing season may limit the effectiveness of improved sugar management practices. This risk will be mitigated by working closely with the Dinas who provide subsidised fertilisers to farmers. Also the use of organic fertilisers will be encouraged where possible to reduce the reliance on inorganic fertilisers.

Risk 5 – Exploitation of smallholder farmers
There is a risk that smallholder farmer participants might be exploited in the sub-contracted grants process through PTPN X. This is a significant reason for employing a dedicated Grants Manager for the project, who will be based in Surabaya and who can closely oversee the grants process. Participation from smallholders will be voluntary and they can opt out of the project without consequences at any time. Other means for mitigating this risk e.g. via clauses in sub-contracts, capacity building etc are provided in sections 6.9, 7.9, and 10.2.14.

Risk 7 – Risks to P3GI, PTPN X, Trunojoyo University and other Private Companies
A lack of farmer commitment to implement agreed activities could mean that the project doesn't succeed and the returns on time and investment from the project partners are lost. This is already anticipated by the project team and should be part of the awareness improvement and training programs.

6.6 Explain how any harm to participants, resulting from these risks, will be managed and reported.

The Grants Manager and the Results and Measurement Manager will play important roles in monitoring and managing the risks identified in 6.5. Both are based in Indonesia and will be in regular contact with all participating researchers and so hopefully we will become aware of any issues before they cause any harm. Any issues or incidents of harm will be escalated to the Project Leader at an early stage.

P3GI will largely have responsibility for day to day interactions with smallholder farmers. As part of the project capacity building process, issues of how to operate effectively and ethically with smallholder farmers will be addressed and reporting protocols will be put in place for early identification of risks that might potentially lead to harm. This will be achieved by specific capacity building training in human ethics to be delivered by Michaela Cosijn. The Grants Manager, Intervention Manager and Results and Measurement Manager will periodically visit case study smallholder villages to review processes.

The research staff from CSIRO who will be working in Indonesia all have good experience in research for development projects, particularly in Indonesia, so there is good cultural understanding, which will help in minimising these risks.

6.7 Is there a risk that the dissemination of results could cause harm of any kind to individual participants e.g. psychological, spiritual, emotional, social or financial well-being, or to their employability or professional relationships - or to their communities?
☒ Yes ☐ No

If Yes, describe the risk and how it will be managed.

There is a potential risk that an individual farmer who chooses to adopt recommended interventions does not benefit financially from their implementation. Care will be taken in carefully explaining the risks and opportunities from getting involved in the project and ensuring there is informed consent. Being innovative and introducing new technologies ahead of the majority might bring with it some questioning from others in the community and this will need to be managed.

6.8 Are there any other risks involved in this research? e.g. to the research team, organisation, others.
☒ Yes ☐ No

If Yes, describe these risks and how they will be minimised and monitored.

There is a potential risk that evaluation of the innovation process and/or the results and measurement evaluation of this and other intervention projects might identify shortcomings in individual or institutional performance. It is important for the project and further development work that these shortcomings are identified and reported as part of lessons learnt. To minimise reputational or emotional risk to participants, public reporting of project evaluation will be done in an aggregated way that does not identify individuals. Identification of specific

institutions in openly available measurement and evaluation reports will be discussed first with institutions so that an agreed process for reporting is developed.

6.10 Explain how the likely benefit of the research justifies the risks of harm or discomfort to participants.

Keeping pace with increasing food demand in Indonesia requires boosting productivity and competitiveness of smallholder farmers because the area of land under agriculture in Indonesia is fairly static in net terms.

Achieving these changes require public and private sector actors to collaborate in new ways. This needs to move beyond the current settings where the private sector provides farmers with inputs, services and information and purchases their products, and the public sector sets the policy environment, conducts research for public goods and helps to disseminate information and technologies. Farmers need to go beyond simple single technology adoption, to the establishment and use of innovation systems that include combinations of new technologies and practices.

The potential gains from this project in stimulating innovation through new partnerships between research institutions and the private sector are very significant. Through the approaches outlined above to prevent harm or discomfort to participants, it is our assessment that the potential project benefits greatly outweigh the possible risks to participants.

Section 7: Research Participants

7.1 What is the expected total number of participants/ groups in this project at all sites?

Participants for the CSIRO research activities fall into two groups:
1. Direct participants – this includes researchers within Indonesian Research Institutions and private sector participants. For this project there are likely to be around 23 direct participants (13 from P3GI, three from PTPN X, one from Trunojoyo University and six from farmer cooperatives in the sub districts of the three Maduranese districts in which the project is operating).
2. Indirect participants – this will include the smallholder farmers who become involved in the intervention case studies. It is anticipated that there will be 2,000 smallholder farmers involved in the project by November 2018.

7.2 Describe the characteristics of the proposed participant group(s) (e.g. age range, gender, affiliations) and why they are relevant to the aims of the project.

The direct participants will involve a range of ages, institutional affiliations and gender mix. Initial discussions with P3GI, PTPN X, Trunojoyo University and farmer co-operatives have involved meetings where there has been a mixed gender and with a range of ages but men have made up the majority of attendees at these meetings. The attached proposal contains the roles for the different researchers. Half of researchers are female and half are male. Smallholder farmer group discussions will have gender diversity because one of the project areas is in empowerment of women.

7.3 Does the research involve as participants people from any of the following groups:
☒ Yes (identify below) ☐ No (go to 7.4)

	Type of Involvement	
• Aboriginal and Torres Strait Islander peoples	☐ Incidental	☐ Targeted
• People in other countries	☐ Incidental	☒ Targeted
• People whose primary language is other than English	☒ Incidental	☐ Targeted
• People in dependent or unequal relationships	☒ Incidental	☐ Targeted
• People who may be involved in illegal activities	☐ Incidental	☐ Targeted
• People in a workplace which is the focus of the research	☐ Incidental	☐ Targeted

Note: The National Statement identifies the need to pay additional attention to ethical issues associated with research involving certain participant populations. Where a project intentionally targets as research participants people from any of the above groups applicants should also consult the relevant chapter in the National Statement and complete the additional questions for that group in Section 10 of this application.

7.4 Where there is the possibility of *incidental* participation from any of the above groups describe any specific ethical considerations that may be applicable for these participants and any strategies that will be adopted when conducting the research.

English is not the first language of any of the participants in the project. That needs to be carefully considered in the ethical conduct of the project because of potential misunderstanding of project goals and activities and commitments. However, within the P3GI project team, most speak good English, as does Pak Faisal, the project lead from PTPN X. All group discussions will be conducted in Bahasa or a mixture of Bahasa and English. This lessens the risk of miscommunication and language problems.

Similarly, discussions with private sector partners will be conducted using a mixture of Bahasa and English and where needed translated into Bahasa/English by staff in P3GI or through the ARISA Results and Measurement Manager (Lauren Xie), who is fluent in Indonesian.

The smallholders who are willing to participate in the project through involvement in case study interventions are likely to be less well educated and at more risk of being in an unequal relationship with Indonesian researchers and/or private sector participants and CSIRO researchers. This will be managed through having due regard and respect for the Indonesian smallholder farmers and their culture. The project will ensure that the project benefits and risks are clearly explained in Bahasa. An avenue for making complaints about project team members will be developed in a way that is independent from the researchers or project team members involved (see Section 10.2.14 for more information on this complaints process.

7.5 Will any particular participants or groups of participants be deliberately excluded from this research?

☐ Yes ☒ No

If Yes, explain why and how any screening process will be carried out.

7.6 Provide a concise description *[no more than 250 words]* of what participation in the project will involve.

Participation in the project will occur through two main activities:
(a) Intervention collaborative sub-contracts – a collaborative sub-contract will be developed with P3PI to work with PTPN X, Trunojoyo University and farmer cooperatives to undertake applied research on improved sugarcane production in the Madura region of East Java. The research will be undertaken by staff from P3PI and Trunojoyo University with private sector partners working directly with researchers and farmers in encouraging uptake of research.
(b) Smallholder farmers agreeing to test the interventions. Smallholder farmers become participants to the project through their involvement in testing interventions in partnership with P3PI, PTPN X and Trunojoyo University.

7.7 Is there any existing relationship between any member of the research team or organisation involved in the research and the potential participants?

☐ Yes ☒ No (go to 7.10)

7.8 Describe the nature of any relationship and what steps, if any, will be taken to ensure that the relationship does not impair participants' free and voluntary consent and participation in the project.

7.9 Describe what steps, if any, will be taken to ensure that decisions about participation in the research do not impair any existing or foreseeable future relationship between participants and the researcher or organisation.

A clear and transparent process for selecting interventions was put in place to ensure a fair and equitable outcome across research institutions. Partnering workshops are planned to take place at the start of the project to allow open discussion about roles and responsibilities in the projects and these will be conducted regularly throughout the project to maintain the strength of relationships and partnerships and to promptly resolve any issues.

It will be clearly explained to smallholder farmers, that if they choose not to be involved in early stages of the project it will not prejudice them for any future work either in this project or future activities. This will be part of a verbal consent process, supported by appropriate documentation recording this verbal consent.

7.10 Is there a risk that the outcomes of the research will impact upon an existing relationship between participants and the researcher or organisations?

☒ Yes ☐ No

If yes, please explain how the risk will be managed.

There is a potential risk that the research evaluating the innovation process might find some institutional constraints. To avoid this possible outcome affecting relationships, researchers and private sector partners will be involved in a participatory way in the innovation research and any negative findings worked through as part of the research and engagement process.

7.11 How will potential participants be ***identified*** and ***recruited*** to the project?
(If an advertisement, e-mail, website, letter or telephone call is proposed as the form of initial contact with potential participants, provide details and attach a copy of text/script.)

Expressions of Interest were sought from Research Institutions and the private sector to put forward intervention case studies. This was done by contacting a range of research institutions and private companies. A series of roadshows were conducted in Indonesian to explain the grants process and templates for the EOIs were provided in both Indonesian and English with applicants free to choose which language they would submit proposals. Grants have been awarded on merit using selection criteria and a selection committee. Some consideration has been given to geographic spread and issues such as diversity.

Selection of smallholder case study farmers will be based on:
(a) existing relationships already established between P3GI, PTPN X, Trunojoyo University and smallholders
(b) input from other public and private sector actors in the agricultural innovation system e.g. Dinas.

All smallholders recruited will be on a voluntary basis undertaken through group processes. The project will use existing company communication channels to engage with and recruit smallholder farmers, done through farmer groups and community leaders. Farmer groups have already been identified in the districts of Bangkalan, Sampang and Pamekasan. Further groups will be identified and engaged using company channels, based on the locations of the project's activities. These groups and individual farmers will be identified at the start of the project, and will comprise of both sugar cane and non-sugar cane producers. Most or many of the sugar cane producers and farmer groups in these locations are already voluntarily working with the company as part of their day to day operations, and some have already worked with P3GI. As a result of the voluntary recruitment process some farmers will be new and this will require careful relationship building. This engagement will be done by the company and P3GI in collaboration with the Dinas for Estate Crops, using key community figures and appropriate cultural approaches.

7.12 If it became known that a person was recruited to, participated in, or was excluded from the research, would that knowledge expose the person to any disadvantage or risk?

☐ Yes ☒ No

If Yes, what are the risks or disadvantages and how will these issues be addressed?

7.13 Will consent for participation in this research be sought from all participants?

☒ Yes ☐ No

If Yes, describe the ***consent process*** and any mechanisms/assessments that will be used to determine a participant's capacity to give consent. *(Copies of any participant information sheets, consent forms etc that will be used as part of the process should be attached to this application.)*

Three approaches to achieve consent will be used in the project. The first approach involved initial discussions and establishment of relationships with P3GI, PTPN X and Trunojoyo University to gauge interest in the project. The next step was a call for Expressions of Interest, which was an open call. After short-listing EOIs, full proposals were requested and in the full proposal there was a section to provide a declaration of consent to participate in the project with both P3GI and PTPN X as signatories. A formal contracting process to implement the Grant is now underway. Small holder farmers who participate in the project will be given information, verbally, to explain the project. As indicated in 7.9, verbal consent forms will be developed and this verbal consent will be documented.

7.14 Are the applicants asking CSSHREC to waive the requirement of consent?

☐ Yes ☒ No

If Yes, explain why consent will not be sought from all participants and how this meets waiver requirements specified in the National Statement.

7.15 Will there be any participants who do not have the capacity to give consent for themselves?

☐ Yes ☒ No

If yes, why is this the case and who will consent for them?

7.16 If a participant or person on behalf of a participant chooses **not to participate** in the research, are there specific consequences of which they should be made aware, prior to making this decision?

No

7.17 Might individual participants be identifiable by other members of their group, and if so could this identification could expose them to risks?

Researchers participating in the project are likely to be to be identified by fellow researchers within the same institution. Given the engagement will be with the institution as well as the individual researcher it is unlikely this could expose participating researchers to any risks. Working with smallholder farmers will be organised through P3GI, PTPN X, Trunojoyo University, Dinas and the heads of farmer cooperatives and farmer community groups. Given participation and discussions are held within group settings, farmers participating in the interventions will be known by fellow farmers. Past experiences in working in villages in eastern Indonesia suggest this does not lead to any risks.

7.18 If a participant or person on behalf of a participant **chooses to withdraw** from the research, are there specific consequences of which they should be made aware, prior to giving consent?

For sub-contracted participants (research institutions, private sector firms) there will be termination clauses placed in the sub-contracts. These will be worded such that withdrawal from the project can occur without penalty, assuming the project finances are in order.

There will not be any formal contracts between P3GI and smallholder participants and it will be clearly explained to them as part of the consent process that there will be no consequences if they withdraw from the project at any time. The company (PtPN X) that is part of the project will be entering into contracts with smallholder farmers to guarantee purchase of their sugar cane. In sugar cane producing areas these type of contracts are normal because of the dependencies of the farmers on the mill and the mill operators on the farmers for a supply of cane to operate the mill at a reasonable capacity.

7.19 Will there be any incentive/payment (e.g. movie tickets, food vouchers) or reimbursement (e.g. travel expenses) given to participants?

☒ Yes ☐ No

If Yes, specify its nature and value, and explain why this incentive /payment will not impair the voluntary nature of the consent.

P3GI, PTPN X, and Trunojoyo University participants will, as part of the project, travel to field sites, to capacity building workshops in other parts of eastern Indonesia, and potentially be invited to visit Australia. Travel includes a per diem travel entitlement, which is standard practice in Indonesia. No such offers or invitations have been made individually in the negotiation phase as who will be most suited to capacity building initiatives in Australia won't emerge until the project is underway.

It is possible smallholders will benefit directly from the project through provision of materials associated with innovative technologies e.g. new plant varieties, testing of fertilisers,advice on sugarcane farming systems, but these will not be used as an incentive to acquire consent.

7.20 Does the proposal involve limited disclosure, active concealment or planned deception to participants?

☐ Yes ☒ No (go to 7.25)

7.21 Why are there no suitable alternatives involving fuller disclosure?

7.22 Why is it thought that participants would have consented if fully informed?

7.23 Will participants be exposed to an increased risk of harm because of this limited disclosure, concealment or deception?

☐ Yes ☐ No (go to 7.25)

If Yes, describe how will these risks be mitigated/ managed?

7.24 Will a full explanation of the aims and methods of the research and why the concealment or deception was necessary be provided?

☐ Yes ☐ No

If No, explain why not.

7.25 Is it possible that the research will involve the disclosure of unlawful conduct, or concealment of a crime, by individuals or definable groups?

☐ Yes ☒ No (go to Section 8)

If Yes, describe what steps, if any, will be taken to protect participants?

The finding of unlawful conduct or concealment of a crime is highly unlikely. There will be significant resources dedicated to monitoring project expenses and acquittals in the intervention case studies so it is expected that any unlawful financial conduct will be detected very early.

7.27 Will the researcher / investigator have a legal duty to disclose any of that information?

☐ Yes ☒ No (go to Section 8)

7.28 How will this duty be managed?

Section 8: Confidentiality and Privacy

8.1 Indicate whether the source of the information about participants which will be used in this research project will involve (tick more than one box if applicable):

☒ Collection directly from the participant
☒ Collection from another person about the participant
☒ Use or disclosure of information by an agency, authority or organisation other than your organisation
☐ Use of information which you or your organisation collected previously for a purpose other than this research project

8.2 Describe the information that will be collected and its source.

8.3 If the information being collected is from another person or agency about a participant will consent be sought from participants (or those with legal authority for them) for the collection and use of this information about them?

☒ Yes ☐ No

8.4 In what form(s) will the information be collected (tick more than one box if applicable).

☒ Individually identifiable
☒ Re-identifiable
☒ Not individually identifiable

8.5 If the information to be collected will be in individually identifiable or re-identifiable form give reasons why this is necessary.

All three boxes have been checked because of the different ways in which information will be collected. The number of researcher and private sector participants will be relatively small (approximately 16) and as part of the innovation systems analysis, information will need to be collected from project participants. Because this information will be collected in an interactive and iterative way it will be necessary to individually identify participants throughout the project.
There will be information collected from individual smallholders and smallholder households to determine baseline attributes and to measure impact of the interventions through the life of the case studies. Individually identifiable information will be collected so that changes in livelihoods as a result of the interventions can be recorded. No individuals will be identified in any reporting of project results. Baseline measurements and evaluation through the project will be based on aggregated data, which will be disaggregated by gender for reporting.

8.5 Is the consent being sought for this information:

☐ specific *[this project only]*
☒ extended *[this project + other research which is an extension of / closely related to this project]*
☐ unspecified *[use in any future research]*

8.6 Provide reasons why this form of consent has been chosen.

There is a complementary AIP-Rural project in eastern Indonesia (PRISMA) that also involves the private sector in trying to accelerate incomes for smallholder farmers. Unlike ARISA its focus is more on large scale impact through known and tested market interventions. The results and findings from the ARISA project will be useful to PRISMA and vice-versa. Consequently, extended consent for data sharing between these two projects would be highly desirable.

8.7 List ALL research personnel and others e.g. student supervisors, funding agencies who, for the purposes of this research, will have authority to use or have access to the information and describe the nature of the use or access.

Name: Ir. Triantarti, MSc
Role: Project Leader for P3GI. Coordinating all activities, solving any project challenges and arranging business activities and farmer institutions.

Name: M. Faisal, SP
Role: Project Leader for PTPN X.

Name: Dr. Lilik K Putra
Role: Project Coordinator for P3GI.

Name: Gufron Anshori, SP
Role: Crop Manager for PTPN X, operations manager for project activities in Madura.

Name: Ariadi
Role: Assistant to Crop Manager for PTPN X, coordination of project activities in Madura.

Name: Fahmi Amrullah Jatisukma, SP
Role: Assistant to District Manager for PTPN X, coordination of project activities in Madura.

Name: Ir. Trikuntari Dian Pratiwi, MSi
Role: Coordinating the various surveys, designing and implementing the training activities, communication with relevant stakeholders, and evaluation of project activities (P3GI).

Name: Ir. Sih Marjayanti
Role: Designing and implementing the demonstration sites, communication with relevant stakeholders for the demonstrations, evaluation of the demonstration sites (P3GI).

Name: Ir. Joko Rusmanto, MEc
Role: Implementing the socio-economic baseline survey, formulation of the policy concept to support smallholder sugar cane development in Madura (P3GI).

Name: Dr. Sri Winasih
Role: Technical assistance for sugar cane planting patterns and general agronomy (P3GI).

Name: Dr. Wiwit Budi Widyasari
Role: Technical assistance for improved varieties of sugar cane and plant breeding (P3GI).

Name: Dias Gustomo, SP, MSc
Role: Technical assistance for land surveys and soil fertility. Assist in ARISA project administration (P3GI).

Name: Aris Lukito, SP
Role: Coordination of market information and training (P3GI).

Name: M. Rasyid. STP
Role: Conducting water availability survey. Technical assistance for land preparation and water management. Resource person for training activities (P3GI).

Name: Silvia Lindawati, SP
Role: Preparation of seed/planting materials of the improved varieties to be used in demo-plots. Resource person for training activities (P3GI).

Name: Arinta Rury Puspitasari, SP
Role: Technical assistance for agronomy and training (P3GI).

Name: Diana Ariani, SP
Role: Technical assistance for agronomy and training (P3GI).

Name: M. Guffron Rosyiadi, SP, MP
Role: Technical assistance for agronomy and training (P3GI).

Name: Khoirul Rosyadi, PhD
Role: Baseline survey of community culture in Madura. Communication and engagement with community leaders
(Universitas Trunojoyo).

Andy Hall (CSIRO; Australian based). Andy is a science and technology policy analyst. He will work with the Indonesian research institute partners to help develop an understanding of the patterns of practice and institutional and policy arrangements needed to enable innovation in partnerships between public research organisations and the private sector. He will be involved in some primary date collection from stakeholders in the innovation environment as well as from stakeholders in involved in the projects action case study partnerships. He will use information collected both to feedback into the progress development of the partnership case studies as well as to draw out generic inferences and lessons for publication and capacity building initiatives in Indonesia and globally.

Liana Williams (CSIRO; Australia based). Liana is a social scientist and will be assisting Andy Hall in the innovation systems analysis. Liana has had considerable experience in working in eastern Indonesia in the uptake of technologies at scale.

Michaela Cosijn – (CSIRO – Australian based) Michaela is an environmental scientist who has worked in for 12 years in developing countries on the interface between natural resource management, poverty and the development of pro-poor value chains. She has extensive experience in working with and brokering relationships with small holder farmers, small to medium sized entrepreneurs, local government, donor agencies and research institutions in the development of innovative markets. Her role will be to provide support to Andy Hall in the development of the reflective processes (e.g. writeshops, workshops, interviews) and peer-to-peer learning which will also form the basis of the capacity building component for which she will be responsible. Her role is linked to the work being undertaken as part of the FSI initiative.

Neil MacLeod – (CSIRO – Australian based). Neil is a resource economist and will work with Indonesian research institution partners and the Results and Measurement Manager (Indonesian based) to help evaluate the economic impact of the interventions. He will not be involved in primary data collection of smallholder farmers as this will be undertaken by partner researchers in Indonesia.

Ben Henderson - - (CSIRO – Australian based). Ben is an agricultural economist who will be using data from across the project to look at regional impacts of widespread adoption of innovations. He will not be involved in primary data collection of smallholder farmers as this will be undertaken by partner researchers in Indonesia.

Grants Manager – (Rob Caudwell, sub-contracted to CSIRO – Indonesia based). The Grants Manager will be the in-country project leader and in this capacity he/she will have oversight

for the individual grants with research institutions and private sector partners. The Grants Manager will also have responsibility for the Results and Measurement Manager (see below).

Results and Measurement Manager – (Lauren Xie, Sub-contracted to CSIRO - Indonesia based) . A key requirement for all DFAT projects is to be able to quantify impact of the development activity. In this project the DCED Measurement and Monitoring framework will be adopted, which requires detailed data collection to demonstrate the impact of the project. Indonesian researchers – (Various Indonesian Research Institutions). The personnel involved in the project won't be known until the grants process gets underway. They will be working with smallholder farmers on implementing the technology interventions and part of that work will involve collecting data on agricultural productivity and household economics. CSIRO researchers providing technical advice. These researchers won't be known until the grants are decided and case study interventions commence. These researchers will be providing short-term technical advice and won't have access to any participant information.

8.8 In what formats will the information be stored ***during*** the research project? (e.g. paper copy, computer file on floppy disk or CD, audio tape, videotape, film)

All information (data, voice recordings, videos) from the project will be stored on computer. Some primary data collection based on interviews or surveys with smallholder farmers may be paper-based although the aim would be to collect it digitally. One computer system will be based in the offices in Surabaya and this will be used primarily to store information on the grants projects (contracts, financials etc) and to store all the information associated with the DCED Results and Measurement system. CSIRO servers in Australia will be used to store research information collected as part of the research activities on innovation systems and economic evaluation, which could include household information collected by Indonesian researchers.

P3GI and Trunojoyo University staff will use their computer systems for storage of data and information associated with their individual grants. It is possible that some information at the smallholder level might initially be collected via paper records and surveys. Taped information or videos will be transferred onto computers as soon as practicable after collection and the original files on recording devices will be deleted.

8.9 What measures to be taken to ensure the security of information from misuse, loss, or unauthorised access while stored ***during*** the research project? (e.g. will identifying information be removed? Will the information be stored in a locked cabinet?)

All computer based information will be backed up to prevent data loss. This will be the responsibility of CSIRO researchers in Australia using standard CSIRO protocols, Indonesian research institutions, and the Grants Manager and Results and Measurement Manager based in Indonesia. Access to this data will be through password protection and/or share drives with restricted access. Identifying information relating to smallholder farmers will be recorded in raw data but will de-identified before being made more widely available. Identifying information on individual research institutions will remain because this is necessary from a governance perspective associated with the grants process. In addition as part of the innovation systems research, information that identifies institutions (but not individual researchers) will be retained because of the need to have ongoing interactions with researchers, which may involve returning to information provided at the start of the project to evaluate how attitudes, processes etc have changed.

It is highly unlikely any commercial-in-confidence information will be generated as project data or project material. It is possible that background material or innovations brought into the project from Indonesian research institutions or private sector partners may be commercial-in-confidence and these will be protected in the first instance via sub-contracting arrangements.

Paper based information collected by P3GI and Trunojoyo University will be stored in secure offices during the life of the project.

8.10 In what formats will the information be stored ***after*** project completion? (e.g. paper copy, computer file on floppy disk or CD, audio tape, videotape, film)

Paper based information will be destroyed at the conclusion of the project. Computer based information will continue to be stored on secure institutional servers for three years after the conclusion of the project to allow research papers to be written. After three years, material which CSIRO has direct responsibility for (research data, grants information, results and measurement data) will be archived on secure tape in Australia and removed from servers and hard drives.

P3GI and Trunojoyo University will be asked to follow a similar process for securely archiving information at the end of the project.

8.11 Specify the measures to be taken to ensure the security of information from misuse, loss, or unauthorised access while stored ***after*** project completion (e.g. will identifying information be removed and at what stage? Will the information be physically stored in a locked cabinet?)

Section 8.10 provides responses on storage of information after the project has been completed. Identifying information relating to smallholder farmers will be removed in any processed data so it won't be available after the project has been completed. All identifying information in raw data will be removed at the end of the project.

8.12 If information on participants is being stored in an identifiable form give reasons why this is necessary.

Information from P3Gi and Trunojoyo University will be stored in an identifiable form so that lessons learnt through the project on innovation systems can be effectively synthesised. Any published material arising from the project on innovation systems and the interface between the research institution and private sector will ensure that individuals and institutions will not be identified.

8.13 For how long will the information be stored after the completion of the project and why has this period been chosen?

Material will be digitally archived after three years and deleted altogether after ten years. It is likely research publications will continue to be developed for a few years after the project is completed, hence the need to keep it on active servers for three years. It is highly possible that development projects in the area of ARISA may continue on for the next decade and the information collected in ARISA may have some future application.

8.14 What arrangements are in place with regard to the storage of the information in the event that the principal researcher ceases to be employed at the current organisation?

The information will be stored on shared drives with restricted access so that only a small group of people who need to use project data (Section 8.7) can access it. This means that the project information and data is available for the project team should the principal researcher depart the organisation. In the case of information stored on computers in the office in Surabaya, the Results and Measurement manager will have access to that as well as the Grants Manager, should the Grants Manager depart the role before the project is concluded.

8.15 Will the information collected for, used in, or generated by this project be disposed of at some stage?

☒ Yes ☐ No (go to 8.17)

If yes, when and how will this be carried out?

It will be deleted from archives after 10 years and this will be done by working with the CSIRO Records section.

8.16 Who is understood to own the information resulting from the research, e.g. the final report or published form of the results?

For the main contracted work with DFAT, CSIRO will own the rights to the work. The Grant Agreement between DFAT and CSIRO provides to DFAT, a perpetual, irrevocable, world-wide, royalty free, non-exclusive licence (including the right to sublicense) to use, reproduce, adapt, modify, distribute and communicate the Agreement Material and any Third Party Material and Pre-Existing Recipient Material. For the collaborative sub-contract with P3GI,

CSIRO will pass on to P3GI ownership of the material collected in the project with provisions to grant rights to CSIRO to use the information.

8.17 Does the owner of the information or any other party have any right to impose limitations or conditions on the publication of the results of this project?
☐ Yes ☒ No

If yes, specify any limitations on publication.

8.18 In what form will the research results be reported / communicated to participants e.g. telephone call, individual letter, workshop, copy of publication/ report.

Workshops and discussions will be the primary means for reporting research results back to participants, particularly private sector partners and smallholder farmers. In the case of researchers in Indonesia we will be working collaboratively on publications relating to the intervention case studies. In the case of the innovation systems research, which is a key area for CSIRO research in this project, results will be communicated in workshops and via formal publications.

8.19 Who will be responsible for communicating the project results to participants?

In the case of the intervention case studies, researchers in Indonesia and, where appropriate, private sector partners will be reporting results back to smallholder farmer participants. For the CSIRO research on innovation systems and economic evaluation of the interventions, communicating project results will be undertaken by the lead researchers (Hall, Williams, Cosijn, MacLeod, Henderson).

8.20 If results will ***not*** be reported to participants explain/ justify why.

8.21 Is the research likely to produce information of personal significance to individual participants?
☐ Yes ☒ No

8.22 Is it intended that identifiable information/ results that relate to a specific participant be reported to anyone other than that participant?
☐ Yes ☒ No (go to Section 9)

If yes, to whom will the results be reported and why is this necessary?

8.23 Will the participant be told that their results will be reported to another person?
☐ Yes ☐ No

If No, explain/justify why the participant will not be told.

N/A

Section 9: Signatures and Approval

As Principal Investigator/ Project Leader for this research project I certify that:

- the information provided in this application is correct to the best of my knowledge
- I will notify in advance the CSSHREC of any ethically relevant variations to the project

- I will immediately report to the CSSHREC any adverse events or harm that occurs to participants during or resulting from the research
- the research team have read and agree to abide by the principles contained in the *National Statement on Ethical Conduct in Human Research (2007)*

Signed:_____Date:_____
(Principal Investigator/ Project Leader)

Signed:_____Date:_____
(Theme Leader)

Section 10: Supplementary Information

Ethical considerations specific to particular participant groups

In addition to the ethical considerations pertaining to the all research participants, specific issues arise in the design, conduct and ethical review of research involving different participant groups. This section elucidates these additional considerations by drawing on the content of Chapters 4.7 and 4.8 of the National Statement.

Note: Only those questions which relate to the participant groups specified for this project in Section 7 need to be answered. All other questions in this section can be deleted.

10.2 Research being conducted overseas

This section addresses the additional considerations identified in Chapter 4.8 of the National Statement.

10.2.1 Please list the countries/ locations that this research will be undertaken in.

Indonesia, East Java Province, Madura Island

10.2.2 How will the principal researcher / investigator monitor the conduct of the members of the research team who will be working overseas?

Key in-country staff for the overall ARISA project will be the Grants Manager (Rob Caudwell) and the Results and Measurement Manager (Lauren Xie), who are based in Surabaya. The Project Leader (based in Australia) will be in weekly contact with these two key project members to ensure the project is progressing satisfactorily in-country. The Project Leader will also visit Indonesia at least eight times per year for Project Coordination Meetings and interactions with in-country project members and Indonesian participants. The Australian project leader and the two in-country team members will be in regular conduct with the Indonesian project Leader (Ir Triantarti) to ensure the conduct of the study is progressing ethically, particularly in the interactions with smallholder farmers. A mechanism will also be established that will allow Indonesian project participants to raise concerns directly with the Project Leader or the Manager, Social Responsibility and Ethics in CSIRO about the conduct of the project in-country staff or visiting researchers from Australia. As project leader in Indonesia Ir Triantarti will have responsibility for P3GI and Trunojoyo University staff activities (though not direct supervision of University staff) working on the project. He will be required to report any issues of conduct to the in-country ARISA project team members or to the Australian project leader. For Australian-based researchers travelling to Indonesia for short-term visits, conduct will be monitored via the in-country project members and through feedback from the participants either through the Grants Manager or directly with the Project Leader.

10.2.3 How have the researchers / investigators taken into account the opinions and expectations of participants and their communities about the effect of any limits of resources on: (a) the way the research will be conducted; (b) participants' post-research welfare; and (c) application of the results of the research?

During the establishment of the interventions and proposal development, workshops and discussions were held with university and private sector partners about the funding and resources available and the rules governing their use and reaching mutual agreement about how these resources can be used most effectively to undertake the research, particularly in the context of its application with smallholder farmers. The project design's exit strategy is based around effective partnerships being established between researchers, the private sector and smallholder farmers that can be sustained beyond the life of this project. This is to avoid issues of resource dependence that can occur in development projects.

10.2.4 Is the research lawful in the jurisdiction(s) where it is to be conducted?

Yes

10.2.5 Are there any local requirements which are necessary for the conduct of this research? e.g. regulatory or other local ethics requirements

☒ Yes ☐ No

10.2.6 If yes, describe the requirements and how they will be met?

A partnership agreement will need to be established between P3GI, PTPN X and Trunojoyo University. This will be undertaken as a 2-day capacity building workshop, which will include awareness raising on ethics.

10.2.7 Will this research project involve access to, use, collection or acquisition of culturally sensitive artefacts?

☐ Yes ☒ No (go to 10.2.9)

10.2.8 If yes, describe the artefacts and how cultural sensitivity will be respected.

10.2.9 Are there any local factors which make it problematic to comply with ethical standards expressed in the National Statement?

☐ Yes ☒ No (go to 10.2.11)

10.2.10 Describe these factors and what steps will be taken to address these matters in a responsible and appropriate manner.

10.2.11 In what language(s) will the research be conducted?

The research will be conducted in Bahasa and English. The Grants Manager has some language skills in Bahasa and the Results and Measurement Manager is fluent in Bahasa. An Intervention Manager is being appointed and she/he will be an Indonesian national.

10.2.12 Will an interpreter to be present during discussions with the participants about the research project?

☒ Yes ☐ No

If No, explain why they will not be present

An interpreter was used for the Roadshows when the Grants process was explained. Also it is intended to use an interpreter for capacity building workshops conducted by CSIRO with the project teams. Apart from those specific activities we will rely on the in-country project team to work with P3GI, PTPN X and Trunojoyo University in a mixture of Indonesian and English. The project leader, Pak Triantarti, has good English, as does the head project member in PTPN X so some activities and discussions between Australian researchers and Indonesian researchers and private sector partners will be conducted in English.

Indonesian researchers and private sector participants will be responsible for the intervention case studies with smallholder farmers and all those discussions and interactions will be conducted in Bahasa, and where appropriate or necessary, local dialects, e.g. Javanese.

10.2.13 Will participants be provided with written information in the language in which the research will be conducted?

☒ Yes ☐ No

If No, explain why they will not be provided with written information in the language in which the research will be conducted.

10.2.14 Describe the procedures by which overseas participants can obtain further information or lodge a complaint about the research project?

Further information about the project will be made available on a website, and the information will be directly available through the DFAT AIP-Rural Office in Surabaya. Specific information about the Grants process will be made available via the Grants Manager and the local administrative team in Surabaya.

Complaints about the conduct of the research project from Indonesian researchers or Research Institutions or private sector participants can be made to the Project Leader or the CSIRO Manager for Social Responsibility and Ethics.

Complaints from smallholders about conduct of Indonesian researchers or private sector participants can be made to the Grants Manager, the Intervention Manager, or the Results and Measurement Manager, who are all based in Surabaya and are independent of the project research team and the private company.

10.2.15 What cultural sensitivities are relevant to the participants in this research project?

An overall aim for AIP-Rural is gender inclusiveness and that will also be an important aspect to be managed in this project.
Most project participants will be Muslim and so respect for the Islam religion and the associated commitments needs to be managed sensitively.

10.2.16 How will these sensitivities be responsibly managed throughout the project?

We will endeavour to make meetings with P3GI, PTPN X, Trunojoyo University and farmer groups/cooperatives as inclusive as possible. We will conduct such meetings in a way (in Indonesian and English) that it gives all participants a chance to express themselves and we will develop case studies and other research activities in a way that encourages gender inclusiveness. Similarly, when working with smallholders, we will be asking partner research institutions to ensure all views are represented.

We will respect religious beliefs and commitments by designing project work and meetings that allows prayers to be undertaken. During important occasions such as Ramadan we will minimise project obligations e.g. avoid long meetings/workshops during the fasting period.