

# Applied Research and Innovation Systems in Agriculture (ARISA)

Draft Design Document



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# Applied Research and Innovation Systems in Agriculture (ARISA)

## Contents

<b>1</b>	<b>Executive summary</b>	.....	5
<b>2</b>	<b>Background</b>	.....	8
2.1	AIP-Rural program	.....	8
2.2	AIP-Rural market development approach	.....	8
2.3	Agriculture in Indonesia: the need for innovation	.....	9
2.4	The need for commercialising agriculture	.....	11
<b>3</b>	<b>Strategic approaches to strengthening agricultural innovation in Indonesia</b>	.....	12
3.1	Understanding agricultural innovation	.....	13
3.1.1	Agricultural innovation system	.....	14
3.2	Demand for innovation	.....	15
3.2.1	Types of innovation	.....	16
3.3	Supply of innovation	.....	18
3.4	Constraints and opportunities	.....	21
<b>4</b>	<b>Project description</b>	.....	24
4.1	Project goal, objective and outcomes	.....	25
4.1.1	Goal and purpose	.....	25
4.1.2	Expected outcomes	.....	25
4.1.3	Project results chain	.....	28
4.2	Theory of change	.....	26
4.3	Delivery approach	.....	29
4.3.1	Selecting partners	.....	33
4.3.2	Building business capacity	.....	36
4.3.3	Flexibility, opportunities, scale	.....	35
4.3.4	Exit strategy	.....	36
<b>5</b>	<b>Implementation arrangements</b>	.....	37
5.1	Duration	.....	37
5.2	Location	.....	37
5.3	Governance	.....	39
5.4	Management	.....	39
5.5	Procurement	.....	40
5.6	Monitoring and evaluation	.....	41
5.7	Risk management	.....	42
<b>6</b>	<b>References</b>	.....	45
<b>7</b>	<b>Annexes</b>	.....	47

# *Applied Research and Innovation Systems in Agriculture (ARISA)*

## **List of acronyms**

AIP	Australia Indonesia Partnership for Decentralisation
BPPT	Badan Pengkajiandan Penerapan Teknologi, Agency for Assessment and Application of Technology
CSIRO	Australia’s national science agency
DCED	Donor Committee for Enterprise Development
DFAT	The Australian Government’s Department of Foreign Affairs and Trade
EOI	Expression of Interest
GDP	Gross Domestic Product
Gol	Government of Indonesia
IAARD	Indonesian Agency for Agricultural Research and Development
ICATAD	Indonesian Center for Agricultural Technology Assessment and Development
IDR	Indonesian rupiah
IFC	International Finance Corporation
IP	Intellectual Property
IPM	Integrated Pest Management
IPR	Intellectual Property Rights
KKN-PPM	Field Work Learning Program for Community Empowerment, through universities
M&E	Monitoring and Evaluation
NTB	Nusa Tenggara Barat Province
NTT	Nusa Tenggara Timur Province
PAR	Participatory Action Research
PCC	Project Coordination Committee, a project construct
PRISMA	Promoting Rural Income through Support for Markets in Agriculture, under AIP
R&D	Research and development
RIs	Research Institutes
RISTEK	Ministry of State for Research and Technology

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SADI	Smallholder Agribusiness Development Initiative
SRI	System of Rice Intensification
TIRTA	Tertiary Irrigation Technical Assistance, under AIP
UGM	Universitas of GadjahMada, Yogyakarta
UNRAM	UniversitasMataram, Lombok

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# *Applied Research and Innovation Systems in Agriculture (ARISA)*

## **1. Executive Summary**

The Applied Research and Innovation Systems in Agriculture project (ARISA) is part of a long history of Australia's support for rural development and agriculture in Indonesia. It forms part of the Australia Indonesia Partnership for Decentralisation – Rural Economic Development (AIP-Rural), Australia's largest and most recent rural economic development program in Indonesia.

AIP-Rural aims to achieve a 30% increase in the agricultural incomes for 300,000 smallholder farmers in five provinces of eastern Indonesia: East Nusa Tenggara (NTT), West Nusa Tenggara (NTB), East Java, Papua and West Papua. AIP-Rural's budget is \$112 million up to December 2018 out of which DFAT will invest up to \$6.5 million in ARISA while CSIRO will contribute up to \$1.5 million.

AIP-Rural supports the Australian government's commitment to promote economic development, reduce poverty and increase food security in Indonesia through stimulating productivity and increased farmer's access to markets. It will do this by partnering with the private sector to scale up "competitiveness enhancing" innovations in agriculture.

### **Why focus on agriculture?**

With an estimated 63% of Indonesia's poor living in rural areas, the rationale for this support is compelling: agriculture employs nearly 40% of Indonesia's labour force and remains critical to the poor's pathway out of poverty; secondly, a more profitable agriculture sector will significantly assist in poverty reduction since a 1% growth of rural agriculture GDP can reduce rural poverty by 2.9% and urban poverty 1.1% (ADB 2006a). For 75% of the rural poor, agriculture is their primary source of income, with food crops contributing 50% of household incomes and estate crops another 30%.

But the sector is being left behind, contributing only 15% to national GDP and suffering from low levels of investment and productivity. A recent assessment of the Indonesian economy has suggested that for Indonesia to maintain growth levels of 6-7% agricultural productivity will need to grow by 60% over the next 15 years (Oberman, 2012). The current value, however, of agricultural production per worker in Indonesia is just one third that of Malaysia. Furthermore, some studies project that agricultural productivity growth in Indonesia, rather than rising, will plateau from a relatively strong annual 1.7% from 1982 to 2008 to just 0.6% from 2000 to 2050 (Sultzer 2013). Part of this underperformance in eastern Indonesia is because smallholders still use traditional farming methods and have little access to modern agricultural markets and production systems (ACIAR EI-ADO 2014). If agriculture is to deliver sustained impact on incomes in a growing and increasingly dynamic Indonesian economy, it will need to become more competitive (Oberman, 2012; WB 2014).

### **Building competitiveness in agriculture:**

One of the key indicators used by the World Economic Forum to assess national competitiveness is innovation or "technology readiness". Within this indicator a nation's spending on R&D is a cornerstone. Indonesia's spending on agricultural R&D is a fraction of Malaysia's (0.27% of Agricultural GDP compared with 1.92% in Malaysia), constraining innovative capacity in agriculture as a whole. But spending more on R&D is far from the solution to competitiveness in agriculture. What the money is spent on, to what purpose, and with whom, are much more relevant questions to address if this spending is to have any real impact on agricultural productivity.

# *Applied Research and Innovation Systems in Agriculture (ARISA)*

## **Innovation in agriculture:**

The GoI's Director of Intellectual Property Rights summarised the core problem facing the innovation system in Indonesia today:

*"We have granted patents to many great ideas...but we have difficulty commercialising them. It will all be useless if we have the technology but have no one to invest in them"*(The Director of Intellectual Property Rights, SciDevNet 2013).

The ARISA project design mission's analysis of the agricultural innovation system in Indonesia confirms the statement above; that the main challenge lies less with the generation of good ideas – these exist in significant numbers in the research institutions (RIs) –but rather more with dissemination. This is due largely to an absence of incentives for commercialising research, the lack of match-making capability between RIs and industry, and relatively few examples, models or mechanisms for effective public-private collaboration.

## **What will ARISA do?**

Under DFAT's AIP-Rural program and in partnership with CSIRO, ARISA will address these constraints by testing new ways to stimulate collaboration between industry and RIs in applying new or adapted agricultural technologies/processes/products. Its focus will be on strengthening linkages between research institutions and the private sector, to unlock the potential of domestic research capacity to commercially apply agricultural innovations that provide direct benefits to Indonesian farmers.

- ARISA will only focus on innovations that already exist. It will not conduct research on the development of new technologies. It will identify and support a small number of practicable and commercially viable innovations that have already been developed in other parts of Indonesia or in other countries, but which have not yet been taken up to any significant extent in eastern Indonesia. It will strengthen these innovations with applied and adaptive research. The project's challenge will be to identify innovations relevant to the needs of smallholder farmers and private firms servicing those farmers in eastern Indonesia, to understand the barriers to widespread adoption and then to address them.
- ARISA's focus on the commercial application of innovations at scale means that it must work with and through effective channels of dissemination and commercialisation. In practice that will mean research organisations collaborating with the private sector. **It is this private sector-research organisation collaboration which is the fundamental innovation being tested and promoted by ARISA.**
- As a project that focuses on innovation systems and their ability to generate sustainable outcomes, ARISA will undertake research on the facilitation process and its efficacy to deliver outcomes that impact on farmer incomes. Such research on the facilitation of systemic changes will include: examining effective brokering functions, quantifying the risks and returns from selecting innovations, adaptation and testing of these innovations in local environments, understanding the barriers to widespread adoption, measuring impacts within the project's time frame and beyond, and disseminating evidence on how public-private partnerships in this area can generate results.

# *Applied Research and Innovation Systems in Agriculture (ARISA)*

## **ARISA's Delivery Strategy:**

ARISA's principal delivery strategy is to provide up to 10 grants to research institution and private sector collaborations that scale up existing or near-commercially ready innovations in areas relevant to smallholder farmer needs in eastern Indonesia. The readiness to provide matching, but not necessarily equal, funds from RI and private sector partners will be a major criterion in the selection of these interventions. Possible areas identified for inclusion in the project are: integrated pest management systems, agricultural mechanisation, and improved dryland farming techniques. These grants will be supported by capacity building and technical assistance tailored to the individual collaborations. The focus of this support package will address specific constraints to innovation adaptation, adoption and dissemination. Through this series of "hands-on" collaborations, ARISA will identify and analyse the barriers to successful uptake and scale up of innovations, and share findings from this analysis leading to an agenda aimed to strengthen the capacity of Indonesia's agricultural innovation system as a whole.

The grants are vehicles through which new models of collaboration can be tested and assessed, and which, if successful, will provide an evidence base for further steps in policy reform and organisational change. Successful collaborations will also provide the basis for replication and scale-up of both ARISA and non-ARISA supported innovations. ARISA's starting point is therefore as much practical as it is exploratory and research-based: all of the innovations with which it deals must lead to a measureable impact on significant numbers of poor farmers by the end of 2018, in line with the overarching goal of all AIP-Rural's-supported initiatives.

The outcome of this initiative will be a suite of evidence and lessons learnt around private sector-research organisation collaborations that are able to achieve concrete results on the ground. It will require strategic management with the capacity to operate as 'development entrepreneurs,' harnessing knowledge of Indonesian agricultural production systems as well as research institutions, by facilitating and brokering relationships, developing business models, mentoring partners, and ultimately strengthening the analytical capacity to identify, respond to and learn from issues as they arise.

In line with AIP-Rural's strategic approach, ARISA's focus is on achieving practical results through private sector engagement, as the private sector holds the keys – the capacity and incentives – to commercial applications of innovations at scale. ARISA will not *directly* address the complex set of institutional, political and socio-economic constraints that currently hamper collaboration between the public and private sector and smallholder farmers – this is a long-term undertaking beyond the scope of the present project. It will however contribute to solutions and approaches to address those longer term challenges through an analysis of its support to the 10 targeted public-private collaborations. This analysis will develop a pragmatic agenda for what needs to happen at the systemic level for greater public-private investment in applied and adaptive research.

ARISA's outcomes will complement AIP-Rural's efforts to increase productivity and farmer incomes through market development activities in key agricultural sectors, irrigation and finance. Synergies will be encouraged between ARISA and other AIP-Rural activities in geographic and sectoral areas, but ARISA's approach to the development of innovations through RI-industry partnerships requires delivery strategies distinct from other AIP-Rural components.

# Applied Research and Innovation Systems in Agriculture (ARISA)

The outreach and impact goals of ARISA are fully in line with those of AIP-Rural. In this case the goals are to reach 10,000 farmers in eastern Indonesia with innovations that result in sustainable increases in farmer incomes of at least 30%. The specific outcomes and outputs to achieve this are spelt out in the project's Theory of Change (section 4.1.3) and the Milestone Matrix (Annex 4).

## 2. Background

### 2.1 AIP-Rural Program

Australia has a long history of supporting rural development in Indonesia, particularly through the Department of Foreign Affairs and Trade (DFAT)<sup>1</sup>. DFAT's most recent program, AIP-Rural (2012-2018), has a total budget of AU\$112 million and is aimed at increasing, by at least 30%, the agricultural incomes of 300,000 smallholder farmers living in five provinces of eastern Indonesia: NTT, NTB, East Java, Papua and West Papua. The Theory of Change underpinning AIP-Rural is that stimulating private sector investment in agricultural inputs and services, relevant to smallholder farmers, will provide sustainable increases in farmer productivity and rural incomes. If more farmers understand the impact of, and have access to, improved assets, technology, inputs and services, they can increase their competitiveness and incomes.

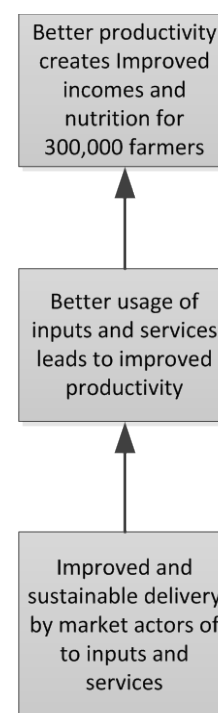
The key strategies that AIP-Rural will use to improve access to these assets, technologies, inputs and services are:

- To identify agricultural commodity sectors (maize, beef, cocoa etc) or cross cutting sectors (mechanization, irrigation, technology, finance etc), that are most relevant to generating pro-poor outcomes in the selected provinces; and then,
- To analyze these sectors in selected provinces to assess the systemic or binding constraints that are most important to increased farm incomes, and then,
- To design sustainable and demand driven interventions that generate 'scalable' impact and outreach to small farmers for whom these sectors are relevant in these provinces.

AIP-Rural comprises several sub-projects, each with the same overall goal of increasing farmer incomes:

- Promoting Rural Income through Support for Markets in Agriculture (PRISMA), commissioned in November 2013, will concentrate its interventions in selected commodity sectors;
- Tertiary Irrigation Technical Assistance (TIRTA) will boost agricultural productivity through improving farmer access to irrigation;

#### Theory of Change Summary



<sup>1</sup>Previously AusAID, to October 2013. Key programs include including ANTARA (2005-2010) with a budget of AU\$30 million for five years in NTT province; and SADI (2006-2010), also with a budget of AU\$30 million for four years in NTT, NTB and Sulawesi provinces, and the NTT Agro-Forestry project \$3.15m, 2010-2014).



## *Applied Research and Innovation Systems in Agriculture (ARISA)*

- ARISA will contribute to increasing farmer productivity or market access by stimulating better access to new technologies, products and processes.
- A “value chain finance” project is also being designed to increase farmer access to small credits through expanded loans or guaranteed from suppliers or buyers in value chains.

AIP-Rural will be delivered through a series of 100 or more interventions with partners from the private, public and civic sectors of the economy. The Government of Indonesia’s executing agency for PRISMA is BAPPENAS’ Directorate of Poverty Reduction. The executing agency for ARISA will be the Badan Pengkajian dan Penerapan Teknologi (BPPT), the Agency for the Assessment and Application of Technology.

To maintain the coherence of all AIP-Rural projects, each program component will use the same results measurement system – the DCED Results Measurement Standard<sup>2</sup>. This system is designed to provide ‘real time’ feedback loops to program management on impact, outreach and value for money.

### **2.2 AIP-Rural’s market development approach**

Rural development programs have conventionally been public-sector focused, with an emphasis on providing services to support agricultural research and extension, food security, infrastructure and rural livelihoods. Over the last decade, however, major bilateral donors have looked increasingly to more sustainable and market oriented approaches that involve co-investment with the private sector (DFID & SDC 2008).

AIP-Rural supports a progressive move for DFAT in Indonesia towards a ‘market systems’ or a ‘making markets work for the poor’ approach. This approach has been successfully applied in rural situations in other countries, including DFAT’s Cambodia Agricultural Value Chain Program (CAVAC) in Cambodia and Regional Pacific Market Development Program (MDP) project in Fiji and Timor Leste.

AIP-Rural’s program for rural economic development in Indonesia is in line with this trend. This approach identifies key constraints to farmer productivity and access to markets, and then forges partnerships with market actor partners – typically the private sector – who have a vested interest in overcoming them. In the case of the Applied Research and Innovation Systems in Agriculture (ARISA) project, these market actors include private input suppliers, producers, buyers and primary processors that see a commercial opportunity in enabling access to innovation, in response to actual farmer needs. ARISA will facilitate partnerships between these actors and research institutions that have the capacity and interest to participate in innovation applications and dissemination.

### **2.3 Agriculture in Indonesia: the need for innovation**

Indonesia’s population was 246 million in December 2012, growing at around 1.5% per year. The population is becoming more affluent, with GDP growth rates averaging around 6% per year in real terms since 2007. GDP per capita now exceeds US\$1,700 nominal and \$4,300 expressed in purchasing power parity.

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<sup>2</sup>DCED Results Measurement Standard <http://www.enterprise-development.org/page/measuring-and-reporting-results>

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

Despite rapid growth in recent years, reducing poverty remains challenging. In March 2013, 28 million people were classified as poor i.e. earning less than the poverty line income of IDR 9,000 per day<sup>3</sup>. While the number of people living in poverty has declined from 37 million people in 2008, the number of people earning less than US\$2 per day has increased to 49%. In addition, the 20% of households categorized as 'near-poor' (households vulnerable to external shocks) has steadily increased and further shocks have the potential to send these people into poverty.

As in many emerging Asian economies, agriculture's relative importance to the Indonesian economy has been declining from 41% of GDP in the 1970s to about 15% in 2011. However, in terms of employment, agriculture still provides jobs for 43% of the country's labor force, and in rural economies this percentage is far higher.

Women's participation in agriculture in Indonesia is high, particularly in rice production where 75% of farm labor is provided by women. In spite of their significant participation rate they continue to be largely unrecognized as farmers, fishers and livestock producers. They also have lower access to productivity-enhancing inputs such as credit, fertilizers and public extension (Collins Higgins Consulting Group 2012). Women are not entitled to separate tax numbers, presenting them with a further obstacle to the formation of their own formal agricultural business activities.

As 63% of Indonesia's poor live in rural areas, agriculture remains critical to their pathway out of poverty. A more profitable agriculture sector will significantly assist in poverty reduction efforts since a 1% growth of rural agriculture Gross Domestic Product (GDP) can reduce rural poverty by 2.9% and urban poverty 1.1% (ADB 2006a). For 75% of the rural poor, agriculture is still their primary source of income, with food crops contributing 50% of household incomes and estate crops contributing another 30%.

Rajah and McCullough suggest that "rural agriculture is the most important pathway out of poverty, rather than a trap from which the poor need to escape" (Rajah & McCullough 2012). For agriculture to deliver sustained impact on income in a growing and increasingly open Indonesian economy, it will need to become more competitive and achieve this it will need to innovate.

In spite of its importance, in recent years agriculture is an increasingly neglected sector. Agricultural policy has tended to move from a focus on food self-sufficiency in the 1980s and 90s to a more open market system in the early part of the 21<sup>st</sup> century. With the new Food Law, introduced in 2013, there has been a shift back to 'Sovereignty, Self Sufficiency and Security'. As has been noted in the past, there is evidence to suggest that such policies will increase poverty levels in the country, largely because of higher rice prices and fluctuations which are induced by import bans (Anderson 2013). Similar restrictions in livestock imports have led to price spikes, incentivizing investors in these sectors to focus more on profiting from arbitrage than from domestic production.

Similarly when it comes to agricultural finance commercial banks are uninterested in providing credit to agricultural ventures (AIP Rural 2013). It is seen as a risky sector with high transaction costs in lending. Even the micro-finance organizations (e.i. BPR and Coops) have small portions (5-8%) of their portfolio in agriculture. Much production finance for smallholder farmers comes through informal lending channels such as input suppliers and traders. These informal mechanisms are a

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<sup>3</sup>Figures from Badan Pusat Statistik ([www.bps.go.id](http://www.bps.go.id))

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

response to the need for lower transaction costs to lending and repayment convenience. New developments in mobile banking may transform the way that small credits are profitably managed.

### **2.4 The need for commercialising agriculture**

The total amount of cultivated agricultural land has remained relatively constant over the last 20 years at 147 million hectares, but within this there have been major shifts from food crops such as rice, maize and legumes to fisheries and livestock (ADB). At the same time – and fueled by private investment in production and research – estate crops such as palm oil, rubber, cocoa and coffee now make up the largest portion of land use at 17 million hectares. While productivity has increased in these estate crops overall agriculture lags far behind other sectors. (WB, *Indonesia: Avoiding the Trap*, 2014).<sup>4</sup>

For Indonesia to maintain its current 6-7% GDP growth trajectory, it has been estimated that productivity in agriculture will need to increase by 60% over the next 15 years (Oberman et al. 2012). There is broad consensus on the pathways to achieve this goal: boosting yields, shifting production to higher value crops, reducing post-harvest losses, strengthening infrastructure and increasing access to land, capital and credit. Effecting these changes may be challenging, however. Several studies conclude that agricultural productivity growth in Indonesia, rather than rising, will plateau from a relatively strong annual 1.7% from 1982 to 2008 to just 0.6% from 2000 to 2050 due to the low availability of additional land, the already high intensity of inputs (particularly in Central and West Java) and low existing levels of investment in agricultural research and infrastructure (Sultzer 2013; Rosegrant et al. 2009).

The eastern and drier parts of Indonesia have among the lowest levels of investment in agricultural innovation. Farming in eastern Indonesia tends to be more subsistence than commercially oriented. Although plot sizes are generally larger than the rest of the country, the climate is drier and more variable, soil fertility is lower and access to dry season water can be restricted. The rural population is sparser, infrastructure is less developed and access to improved practices and inputs (e.g. mechanization technologies, irrigation, improved seeds, pest and disease control techniques) is often limited. Lower production levels, and by extension smaller commodity volumes, increase the costs of collection, transport and wastage. These conditions, exacerbated by continuous outmigration, make it more difficult for farmers with commercial ambitions to find adequate labour to farm more intensively.

Agricultural food trade in provinces like NTT is limited to small regional markets that feed into larger wholesale markets located at ports that in turn serve inter-island markets in which the bulk of produce comes from Java. Processing capacity for estate crops in these provinces is very limited. Cocoa beans produced in NTB are sold to Surabaya for processing. Port facilities are poor and informal charges high, all contributing to higher transport costs and reduced farmer access to more lucrative markets. Ferry costs can account for more than 70% of total transport costs and waiting times at ferries can be 75% of total transport time. In NTB only 46% of roads are considered to be in good condition (Collins Higgins 2012).

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<sup>4</sup>The decrease in the amount of land used for food crop production can be attributed to a number of factors, including the recognition by producers of better returns from alternate crops, productivity increases in cereals requiring less land for the same output and demographic changes brought on by significant migration from rural to urban areas. In Dompu district 95% of the out migration is by women looking for better incomes.[ref]

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

Informal institutions play an important part in the growth of commercial agriculture. Values, norms, sanctions, traditions and taboos strongly influence smallholder production and marketing decisions including those related to input use. For instance in some parts of NTT village leaders and elite members of the community can exercise discretionary control over the management of communal property, discouraging new investments leading to productivity gains (Jaleta et al. 2009).

While this may present a challenging scenario for the commercialisation of agriculture in eastern Indonesia, the potential for improvement is high. Increased demand for food, changing patterns of urban consumption and competitive pressures – local, regional and global – are creating new opportunities in agricultural production practices that are likely to have direct impact on farmer incomes. Applied research can be instrumental in unlocking many of these opportunities: a recent example can be seen in a pilot AIP-Rural intervention (2013) in the maize sector which has seen significant productivity improvements by persuading 4,000 farmers in TTU District of NTT to switch from the traditional practice of reusing their own maize seeds to buying and planting locally produced but better quality open pollinated varieties. The benefits from changes in agricultural practice occurred in just one or two seasons.

Regional characteristics have of course not gone unnoticed by research institutions in eastern Indonesia, where, for example, an understanding of dryland farming is an imperative. Harvesting existing know-how and exploring its commercial potential will be a critical part of ARISA's start-up phase.

### **3. Strategic approaches to strengthening agricultural innovation in Indonesia**

Like many countries grappling with the challenge of accelerating innovation there are systemic failings in the link between knowledge generation through research in Indonesia and wider processes that put this knowledge to use. The 2013 Scoping Study of CSIRO documents many of these constraints, and concluded that the key challenges in regard to achieving effective agricultural innovation practices in eastern Indonesia lie, in the first place, less with the generation of good ideas – these exist in significant numbers in the public RIs and research universities – but rather more with a lack of interface with agricultural industry players who can take these ideas to scale, and secondly the lack of accompanying mechanisms (funding and facilitation services) to support mutually beneficial collaborations.

The following sections describe the analytical framework and rationale for the ARISA project. This framework is built upon the Scoping Study findings, which explored key supply and demand factors in Indonesia's innovation sector. The focus here is primarily 'upstream,' at the input, production and primary processing points of agricultural value chains. Whilst innovation at the 'downstream' manufacturing, processing and distribution end can and does exert a pull on upstream players, Indonesia's food manufacturing industry is already relatively competitive (Oberman et al. 2012), and working at this end of the value chain is unlikely to have medium term impact on the incomes of AIP-Rural's target groups. It is therefore critical that the parts of the agricultural innovation system which are supported by AIP-Rural, respond to the constraints faced by smallholder farmers in eastern Indonesia.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

Given the breadth and complexity of Indonesia's agricultural innovation system, the Scoping Mission could not provide the level of specific and targeted information ARISA requires to identify and develop specific interventions. Further detailed identification of the potential interventions for Indonesia's regional universities to establish stronger links with industry to disseminate technological innovations is required.<sup>5</sup>

### **3.1 Understanding agricultural innovation in Indonesia**

For the purposes of this project, innovation<sup>6</sup> is defined as a process that combines knowledge generation through experience and research with processes and actors that put knowledge into economically and socially productive use. This understanding of innovation focuses attention on the relationships between the producers and consumers of innovation, as well as institutional and policy measures needed to achieve change. From this perspective, policy and development investments need to re-focus from ensuring the *supply* of new technology to supporting appropriate networks that enhance the relationships between research organisations, the private sector, technology users and consumers and strengthening the incentives and other enabling conditions that allow innovations to be *demande*d and used in socially productive ways.

Adapting definitions from the OECD and the EU(2005 and 2012), innovation is a function or capacity embedded in, and emerging from, the interaction of actors in an agricultural innovation system:

- **Innovation by Indonesian smallholders** refers to the successful utilisation and adaptation by Indonesian smallholder farmers of a product (good or, service), process, business practice, marketing or organisational method which is new to the smallholder farmer or has been significantly improved;
- **Innovation in the agro-innovation systems framework** refers to the networking of agri-related stakeholders across three domains: knowledge and education, business and enterprise and enablers and bridging institutions. At both organisational and individual levels the function of these networks is to bring new products, new processes, and new forms of organisations into economic use, together with the institutions and policies that affect the way different agents interact, share, access, exchange and use knowledge.

The economic and social significance of innovation is that it is the central means by which farmers, companies and governments cope, compete and prosper in the face of changing and often unpredictable market, production, demographic and policy drivers. Knowledge can be generated informally through trial-and-error by farmers, or more formally through research and development (R&D) functions associated with both research institutions and companies. The commercialisation of innovation occurs when this knowledge is transformed into a good or service that is both novel and valuable.

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<sup>5</sup>See for instance "Beating the Odds, Locally Relevant Alternatives to World-Class Universities" by Royono and Rahwidiati, in *Education in Indonesia*, D. Suryadarma & G. W. Jones, eds., ISEAS, 2013

<sup>6</sup>An invention is a globally novel idea but cannot be considered an innovation until it has been put into use. The novelty of innovation is in its context within the social and economic systems in which it occurs.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

In the ARISA project the innovation delivery mechanism will be through market oriented collaborations between private firms and research institutions that share a common goal in improving farmer incomes through the dissemination of an innovation.

### **3.1.1 The agricultural innovation system**

In line with the market systems approach adopted by AIP-Rural, innovation in agriculture can be regarded as a value chain or system in its own right. The innovation value chain has supply on one side from public and private providers (including farmers themselves) and demand on the other side from farmers, usually driven by downstream market players. However, it is important to note that innovation is neither entirely demand driven nor supply pushed, but is a combination of the two. Creating conditions to allow this combination is critical for enabling successful innovations.

Key elements in the innovation process are:

- **Generation:** the invention, development or importation of a new technology, process or combination of these that has potential to raise smallholder productivity.
- **Dissemination:** the delivery of the technology or knowledge to farmers either directly or indirectly by private or public sector actors in a form that supports adoption.
- **Adoption:** the uptake of the technology or knowledge, resulting in some benefit by the farmer or a third party (e.g. a primary processor).
- **Adaptation/Expansion/Response:** the use of learning by generators, disseminators and adopters that further refines the original product and generates new ones and/or expands and improves dissemination mechanisms to farmers.

The innovation process is illustrated in Figure 1. Taken as a whole, the process reflects the capacity of the innovation market, which makes it more or less competitive as a sector. The connections between the innovation market and the broader agricultural market are described in Annex 1.

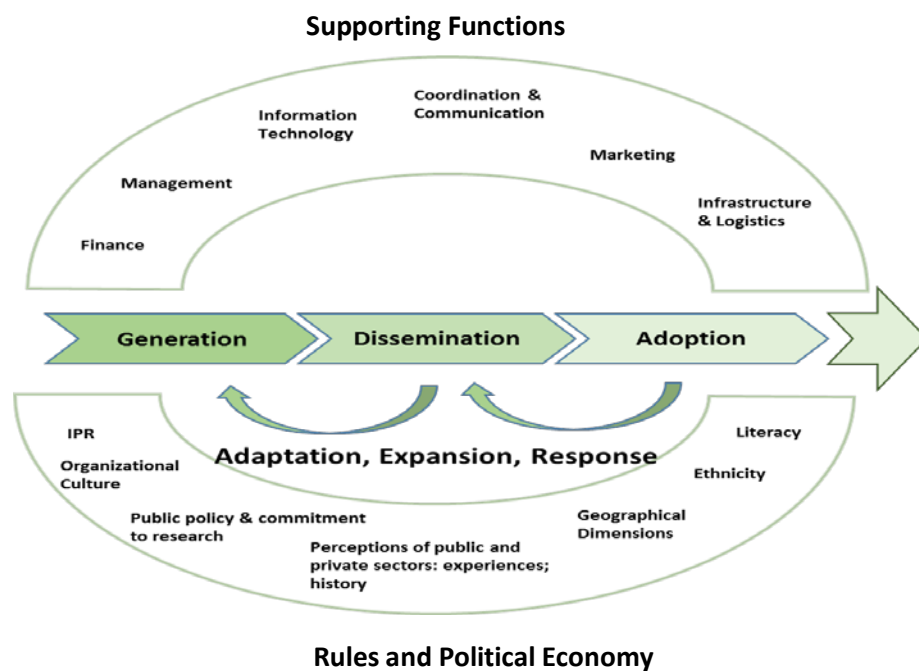


Figure1: The agricultural innovation sector

## 3.2 Demand for innovation in agriculture

Increasing food production is a global imperative. In Indonesia the key factors contributing to this increased demand include a rising population which is shifting its consumption patterns to a greater diversity of foodstuffs as their incomes increase. Global food prices have been increasing for some time, partly stimulated by biofuel subsidies in the US for maize. This trend however is likely to continue at least until 2020 and its influence on prices will also be felt in Indonesia (Anderson 2013). Due to rising per capita incomes in Indonesia, consumption of rice will decrease while consumption and prices for beef, poultry and fish will increase. Higher levels of meat consumption will induce stronger growth in the demand for animal feed, particularly maize<sup>7</sup>. In an environment of higher commodity prices domestic production and productivity will be essential for national food security and growth.

Because land is limited, productivity needs to improve to compete regionally with imports and to meet domestic consumption. With smallholders growing the vast majority of key staples such as rice (Indonesia Investments 2011) and supplying significant quantities of cash crops (i.e. 38% of palm oil (Willem et al. 2013)), Indonesia needs to boost agricultural productivity and competitiveness on small holdings.<sup>8</sup>

For the smallholder this means:

- Increasing yields
- Using greater efficiency with inputs (including water)

<sup>7</sup> 80% of Indonesia's production in maize goes to the feed industry and this sector still imports 20% of its requirements from outside the country.

<sup>8</sup> Indonesia's population is large (around 250 million) and growing (by 2.7%). Land under agriculture, though increasing (from 20% of land area in the 80s to 30% now (World Bank 2014)), is finite and further increase is limited. Indonesia is also becoming more urbanized (now 53% urban, anticipated rise to 71% by 2030 (Oberman et al. 2012)) with more consumers entering the market with higher spending power and demanding new food products. An estimated 90 million additional Indonesians will enter the consuming class by 2030.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

- Reducing pre and post-harvest losses
- Increasing the diversity of staple and cash crops grown
- Boosting the quality of production (including traceability and hygiene)
- Reducing transaction costs
- Being price competitive with imports
- Coping with scarcity of labour<sup>9</sup>
- Coping with increased climate variability.<sup>10</sup>

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.

### **3.2.1 Types of innovation demanded by the agricultural market**

There are essentially five types of innovations demanded of upstream and downstream actors in response to these drivers for agricultural supply and productivity (see Figure 2).

- **Input innovation:** This requires applied research and development to invent and test new products and refine or adapt existing ones. Examples include improved seeds, plant protection materials, soil ameliorants, veterinary medicines, machinery and irrigation.
- **Information innovation:** Information that supports farmer decision making, improves their husbandry and respond to market signals (type, quantity, quality, timing etc). Examples include dissemination of improved husbandry or management practices that interfaces directly with farmers. Another example might involve the use of innovations in ICT for messages about the System of Rice Intensification (SRI) or Integrated Pest Management (IPM).
- **Coordination innovation:** Delivering products and information together to farmers in a form that is easy to access and adopt, for example through new networks or communications technologies.
- **Transformation innovation:** Improving access to markets for smallholders through diversifying the range of processing opportunities and bringing value addition closer to them. An example might be mini palm oil mills that can be economically located closer to smallholder growers.
- **Supply-chain innovation:** Improving efficiency of supply, better integration of contracting arrangements and improved communication or coordination between smallholders and processors, wholesalers or traders. Examples might include improved infrastructure such as storage and drying facilities.

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<sup>9</sup>there will be an estimated 8 million fewer farmers by 2030 (Oberman et al. 2012))

<sup>10</sup> Indonesia is particularly vulnerable to climate change and climate variability (CSIRO 2013a). Changes in the frequency of the Austral-Asia Monsoon and the El Nino Southern Oscillation (ENSO) in recent decades have contributed to increased rainfall variability. Over the last two decades, Indonesia has experienced an increase in the frequency of extreme events e.i. tsunamis, extensive flooding, extended drought periods. This has consequences on rural incomes, food prices and food security.



## Applied Research and Innovation Systems in Agriculture (ARISA)

To raise productivity significantly, farmers will need to move beyond adopting single technological innovations towards adopting improved systemic innovation, i.e. combinations of inputs, practices and management. These innovations are not purely science or research-based, and a number of different actors may supply the components of these systems. This will encourage new forms of collaboration, since the successful adoption and utility of one product or service may be interdependent with the adoption of others.

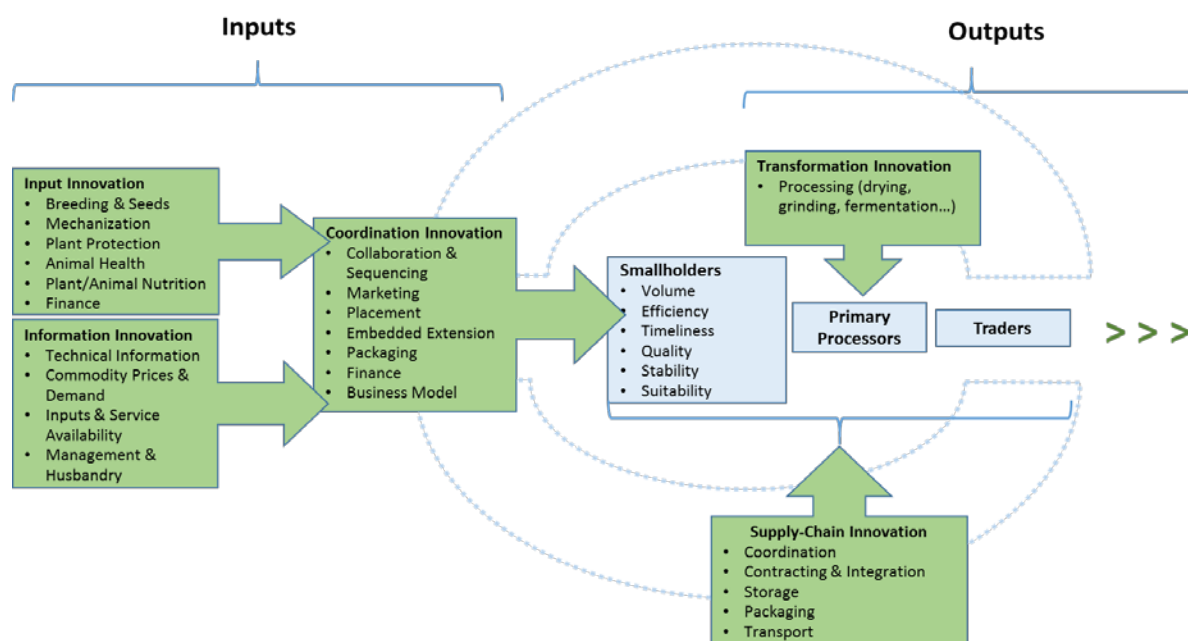


Figure 2: Types of innovation demanded by the market

In more developed agricultural economies, including much of Java and Sumatra, market intermediaries, agricultural consultants and other information providers assist farmers to make sense of the range of available options to optimize their farming enterprise. In eastern Indonesia private actors performing this function are not immediately obvious, while at the same time extension services are overstretched, under-resourced and lack connectivity to agribusiness.<sup>11</sup> Agribusiness themselves will need to adopt or strengthen their “prime mover” role through organisational innovations that build on the coordination and capacity building of actors in input and output markets.

Agribusinesses are increasingly aware of their potential role in this system. For example, Syngenta acknowledges that simply selling pesticides or fungicides to farmers is limited. Consequently they are prepared to invest in IPM, a system of smallholder crop management that includes the use of agrochemicals alongside non-chemical means of control. Another example is IndoFood, who are currently importing the bulk of their yellow soya for *tempeh* production, but would prefer to source it domestically. This requires coordination with seed suppliers and agronomists to support the smallholders to grow it, then with buyers and small *tempeh* producers to maintain quality and

<sup>11</sup>In this document, agribusiness is defined as small, medium and large enterprises that see smallholder farmers as important players in their business model.

## Applied Research and Innovation Systems in Agriculture (ARISA)

standards for the product. Overall these investments in smallholder capacity help to build brand loyalty and develop long-term relationships.

### 3.3 The supply of innovation in agriculture

Indonesia's agricultural innovation systems are characterised by weak interrelations between the private sector (both farmers and market intermediaries) and the public sector (research universities and public research institutions at national and provincial levels)

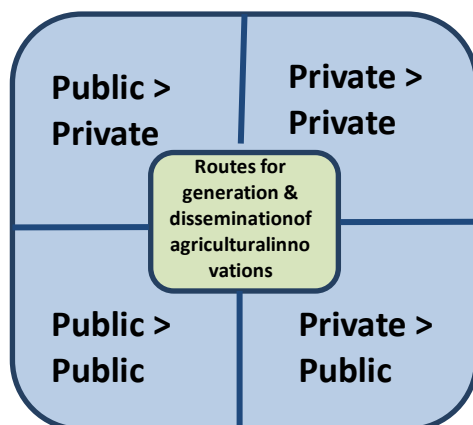


Figure 3. Four routes for generation and dissemination of agricultural innovation

Indonesia's spending on agricultural research and development is a fraction of that of Malaysia (0.27% of Agricultural GDP compared with 1.92% in Malaysia (Oberman et al. 2012)), constraining innovative capacity in the industry as a whole. Within the existing innovation system there are constraints that result in missed opportunities that raising expenditure alone cannot resolve. These include fragmented and complex funding systems, lack of capacity and lack of incentives for both RIs and industry to collaborate to scale up innovations.

The generation and dissemination of information and knowledge can be broadly divided into four routes (see Figure 3) and the following analysis focuses on identifying the interface with the greatest potential to impact the agricultural innovation system positively for smallholders.

#### Route 1: Private sector generation; private sector dissemination

Private sector agribusinesses have a strong incentive to invest in research and development (R&D) as it helps to grow their market share, and increase competitiveness. In addition, in-house R&D can be specifically tailored to the needs of the firm and the intellectual property generated can be readily protected.

The design mission for this project identified several medium and large firms investing in R&D, from Budi Mixed Farming (a small family firm making plant nutrition products) to Quick Traktors (a large manufacturer of 2-wheeled tractors). The former described their R&D as more of a hobby while the latter has invested millions of dollars in R&D and in modern computer aided design technology.

To address a capability or technology gap, agribusinesses tend to: collaborate on a piece of mutually beneficial R&D (e.g. a joint venture in which IP is negotiated); purchase the technology to benefit from after sales training; or purchase a firm with a given capability. Occasionally they source specific advice or knowledge from researchers in public research institutes, with whom they have experience or trust. This is the most prevalent innovation dissemination route in Indonesia today.

#### Route 2: Private sector generation; public sector dissemination

This interface refers to agribusinesses using the public extension service as an outreach vehicle for their products and services.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

This route appears to be uncommon, adhoc and not supported by institutional mechanisms, since decentralized extension service activities are determined and funded by Districts. In those Districts where other activities have higher priority, extension funds are limited and human capacity thinly spread, lacking routes to innovation research that would increase relevance. While there are examples of the private sector hiring public extension workers on an informal basis, it would be difficult to scale up this route without structural reforms in the public extension system.

### **Route 3: Public sector generation; public sector dissemination**

This interface focuses largely on the generation of technology and knowledge by public institutions under the Ministry of Education and Culture (research universities), Ministry of Agriculture (agencies under IAARD, such as the national research centres and agencies under ICATAD) and agencies under RISTEK; and dissemination of innovation to farmers in the field largely by university schemes and provincial BTPs. A stakeholder map of this route appears as Annex 2.

#### **Box 1: A missed opportunity in mini-palm oil mills**

Indonesia's palm oil productivity lags far behind that of Malaysia. A critical constraint is getting palm fruits from smallholders to large plantation-based mills quickly to avoid spoilage. This is hampered by poor roads.

BPPT developed a mini-mill that could bring milling closer to smallholders and would largely mitigate this problem. Two mills have been successfully piloted and have been operating for several years. However this technology has not been taken up because there has been little or no interface with companies who could manufacture, sell, finance and install the equipment, and train entrepreneurs or farmer groups to manage their operation.

Public universities have three mandates: education, research and community service. Recognised indicators in the public university system are relatively simple for education (e.g. number of classes, students etc.) and research (e.g. publications), but they are less defined for outreach to farmers (current metrics are more around time input than outcomes achieved).

There are other well-developed community outreach schemes in some universities, such as the Field Work Learning Program for Community Empowerment (KKN-PPM) scheme which places students in multi-disciplinary teams to work on community projects. These appear to be more oriented towards output and education than sustainable research outcomes.

The public-to-public sector research and dissemination route is hampered by its focus on institution-to-farmer interactions which limit scale and sustainability. Dissemination of research results tends towards direct transfer from individual researcher to communities or farmers and, as such, the opportunity for scale, deeper impact and sustainability is often lost. Nevertheless public research universities recognise the need to broaden their outreach to the private sector and have the flexibility to improve their interface with agribusiness: many acknowledge that this outreach activity can sit under the community outreach mandate without any change at the policy level. They are also aware of the need to drive performance in this regard in order to measure outcomes such as farmer adoption and productivity.

A similar scenario occurs at national research agency level (e.g. IAARD and BPPT). As with the research universities, IAARD and BPPT's principle dissemination routes tend to be directly to farmers

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

through various local government outreach mechanisms and pilot projects with limited scale or replicability. The recognition of the utility of using private firms as conduits for innovation dissemination is generally low partly because of mistrust of the private sector but also because of cumbersome procedures.

Potential entry points are the newly established RISTEK-facilitated consortia between universities, industry and local government to collaborate on geographical and sectoral research priorities. One example of this is the Consortium on Large Ruminants, hosted by UNRAM, which has established collaboration, coordination and an impact mandate with three regional universities, BPTP, Dinas and local government and industry members.

### **Route 4: Public sector generation; private sector dissemination**

As outlined above, the record of successful, long term public-private partnerships in Indonesia is not substantial. Analysis suggests that adaptive research projects undertaken under the multiple funding schemes provided by Government of Indonesia ministries and agencies are rarely monitored or recognised for their replication, scale or impact potential. To a large extent these funding schemes are supply driven, determining the kind of research that grant recipients can undertake as well as the expected outputs (e.g. patents, publications etc). Market demand for research is currently not considered, and agribusinesses are rarely consulted. Because there is insufficient funding available for either disseminating research results to scale or for achieving commercial viability, successful pilot projects rarely meet their development potential.

Where universities and public research institutes have collaborated with the private sector it has often been in the context of donor-driven projects with public-private partnerships that have focused more on a project output than growing the institutional capacity to forge more alliances. The consequence is missed opportunities for outreach and impact by RIs on the one hand and missed opportunities on the other hand by industry in benefiting from innovation expertise in research institutions. One example of this is a joint project between SADI (the forerunner of AIP-R), IFC and Garuda Foods in Lombok that had research inputs from UNRAM. In spite of impressive results— raising productivity by 30% in 8,000 smallholdings – there has been no further collaboration between UNRAM and Garuda Foods (Garuda Foods 2011).

### **Box 2: The system adoption imperative**

**Quick** is Indonesia's leading hand-tractor manufacturer with 70% of the market. They have invested heavily in the development of a rice planter but have delayed releasing it because the market isn't yet ready. To realize the benefits of the planter, farmers would need to adopt improved seed technology, nursery management and land preparation, which is beyond their current sphere of influence. Quick therefore has a "stake" in collaborating with others on innovation dissemination.

**Syngenta** is a global seed and agrochemical giant. In Indonesia they have realized that they need to think beyond selling individual products (such as pesticides) to fix individual problems and are investing in extending IPM to farmers together with Bayer (a competitor).

These examples highlight the need for farmers to adopt more complex combinations of products and practices. This also requires agribusinesses and RIs to collaborate in new ways.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

A common interface between universities and agribusinesses can occur in the contracting of individual researchers as consultants. This is largely driven by the reputation of researchers and their personal relationships with the relevant agribusiness, and confers little benefit to their institutions. For example, a UGM researcher partnered with Unilever to develop improved farmer selection of soya varieties. Whilst this work had success in terms of increased yield (30%) and outreach (an increase of over 7,000 growers), more widespread benefits were limited because only one researcher was engaged.

Agribusinesses tend to be reluctant to seek collaboration with research institutions for a number of reasons, including perceptions of overly rigid bureaucracy, inferior research quality, higher costs in comparison to other private sector players, business risks associated with jointly developed intellectual property, and an unbalanced investment of resources by RIs in the potential collaboration.

In summary, although the potential mutual benefits are significant, opportunities for public-to-private collaboration are limited. This is due largely to a mismatch of incentives, the lack of a clear understanding of how to structure this interface combines with the very limited number of successful collaborations from which experience can be drawn.

### **3.4 Constraints and opportunities at the public-private interface**

Of the four routes described above the public-private interface offers the greatest potential for the ARISA project to effect change in the shorter term. Public research universities often recognise the benefits of collaborating with private industry but currently lack the outward-facing mechanisms, internal processes and human capacity to cast them as credible R&D partners. Competing and overlapping interests within and between universities are also a constraining factor here. With respect to the impact of RIs on the innovation market place, for instance, a senior official in the Directorate of Intellectual Property Rights stated: *“We have granted patents to many great ideas...but we have difficulty commercialising them. It will all be useless if we have the technology but have no one to invest in them”* (SciDevNet 2013)<sup>12</sup>.

There are constraints in agribusinesses that impinge on the achievement of the project purpose (lack of trust of RI competence, low levels of information, etc) but there are also deficiencies within the RIs in their structures, functions, skills and incentives. RIs often lack business development and marketing capacity which prevents them having effective collaboration with agribusinesses and which goes beyond contract research and individual consultancies. This includes fragmented decision making, overlapping responsibilities and a lack of clear communication channels that result in industry players being unable to identify an obvious value proposition for RI collaboration.

This leads to: 1) missed revenue opportunities for public RIs; and 2) missed opportunities to develop and market a wider business of research outputs and services that could respond to industry demand in a more systemic way. This in turn leads to 3) missed opportunities for agribusiness to offer better products, processes and technologies to smallholder farmers that respond appropriately to farmers' needs.

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<sup>12</sup>In terms of actual fees from royalties and licenses, Indonesia generates only \$0.014 per person, compared with \$31 per person in China and \$13 per person in India (World Bank 2012).

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

Four key constraints to more effective outreach of research institutions (focusing primarily on universities) to agribusinesses in collaborative adaptive research were identified by the design mission and are summarised below.

### **Constraint 1: Lack of an effective interface between university research departments and agribusinesses (capacity gap)**

Universities and public research institutes lack effective market-oriented entities, processes and cultures that would interface with agribusinesses, commercialize research and develop collaborative adaptive research projects.

### **Constraint 2: Lack of organisational culture to commercialize research (incentive gap)**

Research departments and their staff do not have incentives that are aligned with market demand for their research and therefore seldom pursue opportunities to commercialise it.

### **Constraint 3: Limited confidence in the quality of RI collaboration or research (demand side incentive/perception gap)**

Agribusinesses rarely consider outsourcing R&D to RIs due to perceptions of bureaucratic processes, poor quality in research methods, the low relevance of research outputs and limited resources to support collaborations.

### **Constraint 4: Lack of effective and transparent financing for collaborative adaptive research projects (funding gap)**

Research priorities and funding are not driven by a cohesive policy or strategy. Diverse funding mechanisms, insensitivity to market demands (compared with technology supply) and the lack of coordination between funding agencies results in low prioritisation for collaborative, market-driven research.

The first of these constraints, the **capacity gap in the lack of effective interface between university research departments and agribusinesses**, is proposed as the most strategic focus for ARISA and its most promising area of influence.

The entry point for this support will be through public universities that conduct or aspire to conduct research (and also other public research institutes) and private firms that are interested in commercialising an innovation that will have impact at the farm level. Many research institutions are innovation generators and have the desire and flexibility to become more commercial, but they largely lack the capacity, resources or incentives to do so. Addressing constraints to effective public private collaboration is a key competence and value-add of AIP-Rural and the ARISA project. However ARISA cannot **directly** address the complex array of institutional and regulatory constraints in Indonesia's innovation system, many of which require long term solutions. Instead ARISA will make targeted contributions to strengthening innovation systems by identifying and bringing to scale up to ten public-private collaborations on agricultural innovations relevant to smallholder farmers in eastern Indonesia and through an analysis of these collaborations develop a practical agenda for reform at the institutional and policy levels. These core interventions are designed to:

- build capacity in key agricultural research institutions to optimise their mandates to achieve more sustainable outreach to farmers through collaboration with the private sector;

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

- test, demonstrate and disseminate new models of public-private collaborations in agricultural innovations in eastern Indonesia;
- through the scale up of relevant agricultural innovations in areas such as pest management and dry-land farming, provide increased incomes for up to 10,000 smallholder farmers.

The following section details the project's strategic approach and delivery mechanisms.

### **4. Project description**

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 up to 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). It will engage in a series of targeted capacity-building activities with these public and private partners to change behaviours towards adoption and diffusion of innovation, moving beyond a focus on the publication of research to its commercialisation.

To be deemed successful, these collaborations must provide direct and sustainable benefits to smallholder farmers at sufficient scale to support the continued use and uptake of the specific innovation to be tested. Results from ARISA and other AIP-Rural components will inform existing and future rural economic development strategies in eastern Indonesia for both Australian and Indonesian Governments, including planning and design for any further program phase.

The project's starting point will be a) targeted public research institutes – mainly, but not exclusively, public and private sector universities with strong presence in eastern Indonesia – with whom CSIRO will partner to address systemic constraints in the Indonesia's innovation system and b) private firms that see a business opportunity in the commercialisation of innovations that will impact on farmer incomes and are seeking collaboration with a research organisation to assist them in this venture. The lead role of the private sector is critical if more new and improved products, services and processes<sup>13</sup> are to be embedded sustainably in the market. It is this element of private sector engagement that is perhaps the most unique feature of this project for both DFAT and for CSIRO, DFAT's implementing partner.

In line with AIP-Rural's market system strengthening approach, the key partner in the innovation, testing and dissemination process will be agribusinesses who play a lead role in embedding more new and improved products, services and processes sustainably in the market, and who respond to the needs of farmers irrespective of the origin of technology and information that underpins innovation.

ARISA will be managed as a separate project under AIP-Rural, with the same overall goal of increasing farmer incomes. It will share its geographical concentration on eastern Indonesia, with an

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<sup>13</sup> By products we mean things which farmers can buy to improve their businesses such as seeds, agrochemicals and tools; services are performed by third party providers such as tillage; processes are either means of presenting products and information in combination to allow farmers to adopt them easily, or downstream processes such as improved processing or logistics that provide better market access.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

initial focus on East Java, NTT and NTB provinces. Integrated monitoring and results measurement mechanisms based on the Donor Committee for Enterprise Development (DCED) measurement systems will be used to monitor and manage these collaborative arrangements and also to identify performance and incentive gaps in the RIs and private firms for further targeting of technical inputs. Evaluative work will focus on those parts of the change process that are complex (e.g. relationships between researchers and private sector intermediaries; links between problems/opportunities perceived by smallholders and innovative solutions).

The following section outlines the project goal, logic and delivery approach to achieving this vision.

### **4.1 Project goal, objective and outcomes**

ARISA's overarching goal is consistent with those of all other AIP-Rural initiatives; to increase farm incomes for smallholders in eastern Indonesia. In the case of ARISA this will be achieved through the adaptation and dissemination of innovations, leading to the project's objective.

#### **4.1.1 Goal<sup>14</sup>**

*More smallholder farmers in Eastern Indonesia increase their incomes from agriculture.*

*Outreach target:* At least 10,000 smallholders in eastern Indonesia increase their incomes from agriculture by at least 30% by December 2018.

#### **Objective**

*Research institutions and private firms increasingly collaborate to adapt and produce commercially applicable agricultural innovations.*

Two outcome areas will contribute to achieving this objective:

- 1) Private firms increase investment in adaptive research to develop commercially viable products, practices and technologies that benefit farmers in eastern Indonesia; and
- 2) Public or private research institutions increase investment in adaptive research to develop commercially viable products, practices and technologies that benefit farmers in eastern Indonesia.

The Theory of Change that shows how these outcome areas are connected with the goal of AIP-Rural is summarised in Section 4.1.3 and the more detailed Milestone Matrix (including specific measurable targets) over the 4-year period of the project is presented in Annex 4.

#### **4.1.2 Expected end-of-program outcomes**

**Outcome 1:** *Partner research institutions increase investment in adaptive research to develop commercially viable products, practices and technologies that benefit farmers.*

The focus of Outcome 1 is on developing the market-oriented capability of targeted RIs to interact with agribusinesses so that they can develop a viable research facility offer or proposition to agribusiness which is based on their human capabilities and their intellectual property. The additional focus of this outcome is to optimise RIs' existing research infrastructure such as

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<sup>14</sup>A results chain appears as 4.1.3 and accompanying Milestone Matrix appears as Annex 4. The project goal is aligned with and contributes to the overall goal of AIP-Rural.



## *Applied Research and Innovation Systems in Agriculture (ARISA)*

laboratories and trial sites; develop closer links to farmers' enhance student access to farmers; and stimulate some core operational financing from the public purse.

Outcome 1 is also concerned with developing the capacity of relevant RI staff to be able to design, manage, monitor and deliver collaborative research projects and to respond to the demands from 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.

Whilst revenue from the commercial application of IP will be measured, it is not likely to be significant during the life of the initiative and is not considered to be the main driver of change in the incentives of RIs to engage in this process. It is, however, anticipated that positive organisational change will arise from key personnel contributing to the wider research-for-development agenda, supported by CSIRO.

Detailed stakeholder mapping and needs assessment with selected RIs will form the basis for interventions that seek to address capacity and incentive gaps of key staff. Ongoing critical reflection of the innovation systems process will provide strong connectivity between Outcomes 1 and 2. As RIs and agribusinesses engage in collaborative research projects, capacity and incentive gaps will become more apparent and feed into further capacity building under Outcome 1. While this capacity building of RIs is an essential component of the project, care, however needs to be taken that this outcome does not dominate the project's results landscape. For this reason project priorities are squarely place on the successful outcomes of collaboration rather than on the delivery of capacity building measure on their own.

**Outcome 2:** *Private firms increase investment in adaptive research to develop commercially viable products, practices and technologies that benefit farmers.*

As previously noted the private sector is already investing in their own R&D to develop the new products and processes they need to become more competitive. The overall volume of this however is extremely low in comparison with other comparable Asian economies. The aim of this outcome is to increase both the quality and quantity of this investment so that it is beneficial to both investors as well as small farmers in eastern Indonesia.

The focus of this outcome will be on work with private firms to identify and shortlist promising innovations that are worthy of investments and then to provide them a) the support to constructively engage with RIs and b) any specific technical assistance to help the firms to understand the market into which the innovation will be supplied.

The net result will not only be increased domestic food supply but also greater capacity to participate in global food markets and increased opportunities for sustained increased incomes for the 41 million Indonesians (43% of the workforce) engaged in the sector as farmers and labourers (Oberman et al. 2012).

*Targets:*

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

- Up to 10 additional contracts for collaborative applied and adaptive research and dissemination of innovation in agriculture of the target RIs are facilitated with project support<sup>15</sup>.
- The private sector has contributed at least 50% of their intervention costs by June 2018.

### **4.2 Theory of Change**

ARISA's development logic or theory of change is shown in Figure 4. In the first instance ARISA will identify opportunities for collaboration of selected RIs and agribusinesses through analysis of the public research funding landscape and on how incentives can be realigned for these collaborations. ARISA will build on existing analysis of the capacity of RIs in eastern Indonesia (which varies widely) to inform the nature of support it provides to RIs.<sup>16</sup> This analysis will be augmented by ongoing project research on the pilot projects, the key source of learning for the project. This analysis will provide the basis on which to test and prove the concept that industry-RI collaborations can generate sustainable benefits to smallholders, while also being a foundation to strengthen the core mandate of RIs.

The pilot grants function as “a proof of concept” to test and demonstrate the potential benefits brought about by increasing private firms' investment in adaptive research to develop commercially viable products, practices and technologies (Outcome 1), and by improving RI capacity in developing and marketing their offer to agribusinesses (Outcome 2). The project will document and analyse each pilot activity as it progresses. Success will hinge on the outcomes achieved through changes to the industry-RI partnerships, as evident in the benefits that flow to smallholder farmers.

On the basis of this analysis, the project will develop a dissemination strategy (or strategies) to share lessons learnt from industry-RI collaborations with key stakeholders. These strategies will be to support dialogue within research and agribusiness networks and promote understanding among actors in the innovation system, including funding agencies, of the benefits of RI and agribusiness collaboration. As a consequence, more publicly funded grants for this type of collaboration will be stimulated (including the streamlining of existing ones), and greater incentives will develop within industry to seek partnerships with RIs.

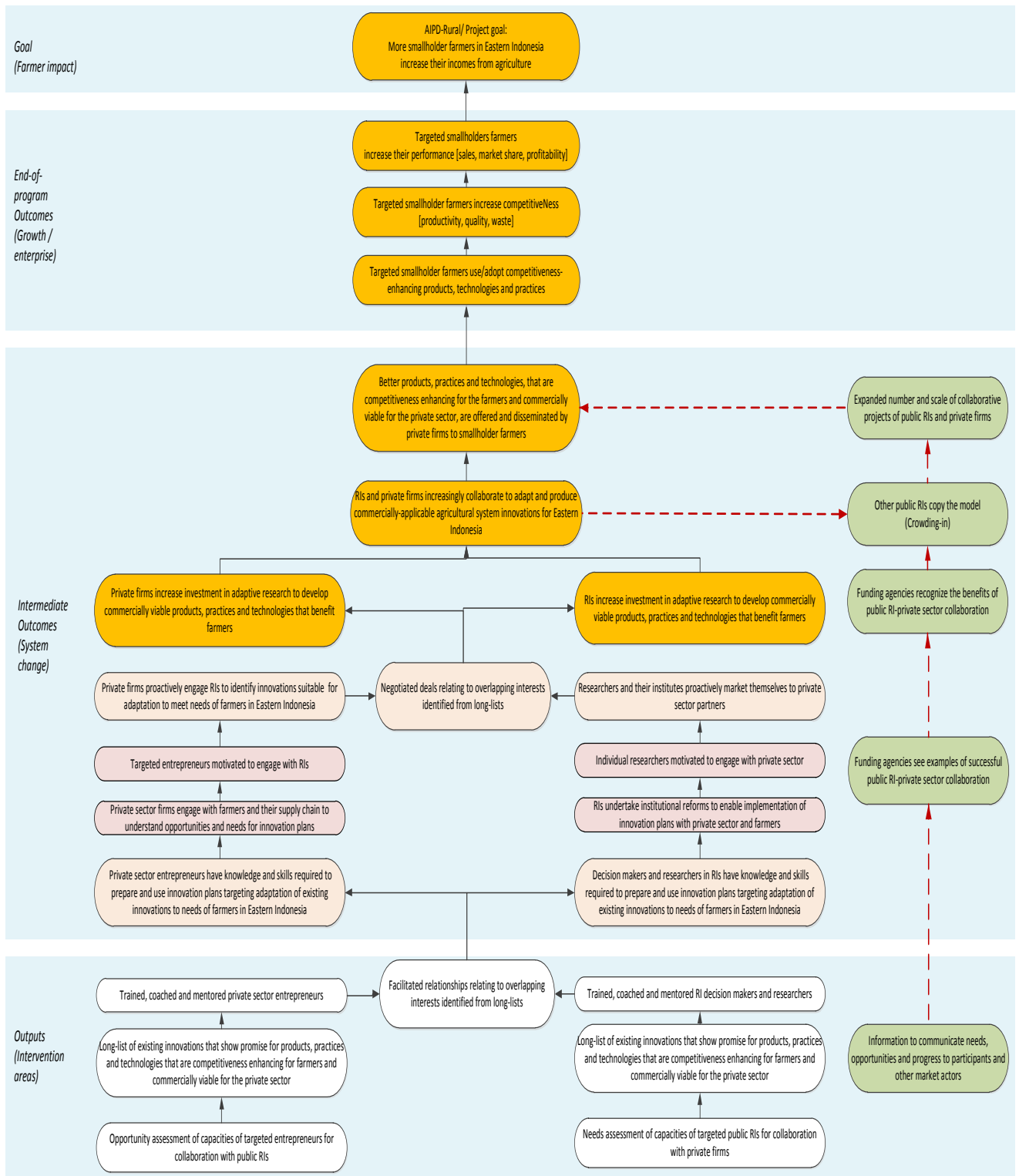
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<sup>15</sup>Note that these contracts will include substantial financial commitment from both public and private parties, a clear route to impact at farm level at scale (1-2,000 farmers) and a clear and plausible business case that takes the innovation to wider scale beyond the project.

<sup>16</sup>DFAT's Knowledge Sector program has undertaken in-depth analysis of the Tertiary Education sector and has ranked research institutions according to their capacity and status. This analysis suggests that none of the existing public research universities are active in eastern Indonesia, but that there are a number of regional universities (both public and private) that aspire to be research institutions and are potential partners for adaptive research.

# Applied Research and Innovation Systems in Agriculture (ARISA)

## Results Chain For Agro Innovation System Project (V rh)



*Note 1: Collaboration refers to collaborative projects between public RIs and private firms for applied and adaptive research and dissemination of innovation in agriculture from an agro innovation system perspective, that enhance the competitiveness of farmers and are commercially viable for the private sector, and are based on a contract.*

*Note 2: Brown dotted lines indicate scale up strategy*

**Figure 4. Project results chain**

# *Applied Research and Innovation Systems in Agriculture (ARISA)*

## **4.3 Delivery approach**

ARISA will approach industry and RIs in different ways. While potential research partners are fewer in number and relatively easy to identify, their incentives to commercialise innovation are currently low. On the other hand, private sector firms are numerous and more difficult to identify, although their incentives to innovate are usually transparent. Both sides will be approached in parallel with different offers, depending on their status and circumstances:

- RI partners will be identified through a competitive process, with the selection criteria being a) willingness to develop and invest in their interface with agribusinesses in commercialising their know-how or adapting other innovations to eastern Indonesia; and b) the existence of concrete and suitable innovations that have the potential for rapid commercial applications within 4 years.
- Private firms will be contacted through several channels (KADIN, APINDO, PISAgrO, smaller business associations and the media). Criteria for their selection will be a) willingness to co-invest in collaboration with a research institution of their choice; and b) their capacity to reach a credible number of farmers in the diffusion of the innovation.

Capacity building for the private firms is expected to be less structured and more specific to the innovation under development and the particular capacity gap the firm needs to fill in order to sustainably influence the innovations development or to disseminate in a commercially viable way.

The project will support and implement integrated monitoring and results measurement systems to assist the RIs in monitoring and managing these collaborative arrangements, and also to help in learning from private sector engagement to improve future performance. This will also be used to identify capacity and incentive gaps in the RIs for further targeting of technical inputs.

The project's strategic focus will include:

- Income and livelihood benefits within 3-4 years, delivered through purposefully brokered private-public partnerships that have potential for scale and replication.
- A clear and significant role for the private sector in the commercial application and dissemination of innovation as a way to achieve scale and sustainability.
- Structured and measured support for the RIs to develop and enhance their ability to engage with private firms in the development and dissemination of agricultural innovations that increase the reputations of the RI and their researchers.
- Promoting an enabling environment around public financing and other policy instruments for adaptive research collaborations in agriculture, utilising evidence from successful project case studies in both partnerships and research.

### **ARISA Innovation Grants**

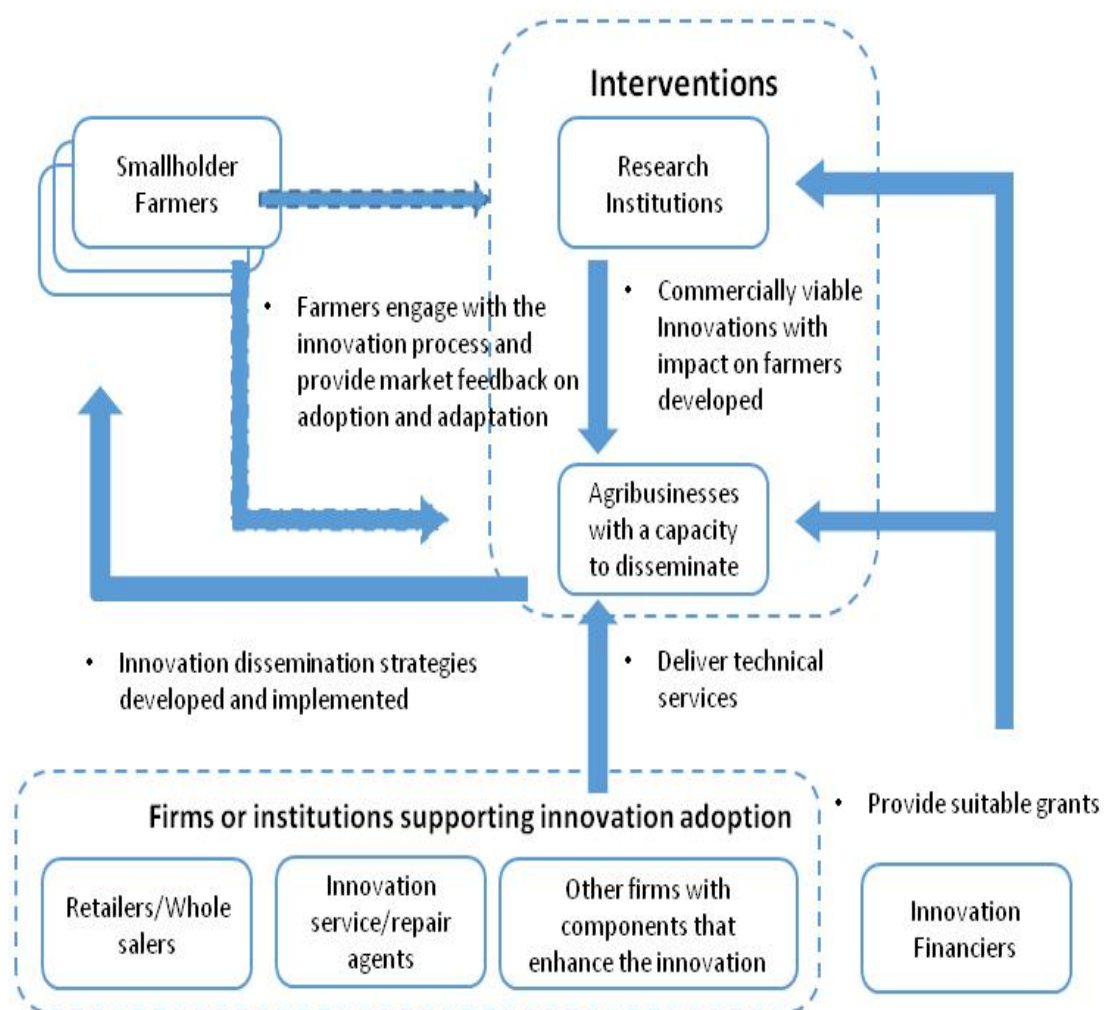
Figure 5 depicts the project's core delivery model. Starting in the bottom right hand corner of the diagram, the project will provide grants to private firms and RIs that share a common goal in developing commercially viable innovations that will have impact on smallholder farmers.

## Applied Research and Innovation Systems in Agriculture (ARISA)

These grants support public-private collaborations that adapt and test the innovations to a point where they can be viably disseminated by the private partner(s) of the collaboration. In some cases this may involve other supporting firms or institutions that have complementary inputs that can improve the impact of the innovation.

In the top left hand side of the diagram, smallholders adopt the innovation and then provide feedback to firms and research institutes on the efficacy of the innovation and any adaptations needed to improve its value for money.

### Generic Delivery Model for ARISA Innovation Grants



**Note:**

- Each interventions may vary, depending on the service agreement between the RI and private firm

Figure 5. Summary of core delivery model

### Box 3: Possible Intervention Example

*The cultivation of chillies and shallots is a major income earner for more than 1 million smallholders in Indonesia; many of these farmers are in eastern Indonesia. Current demand outstrips supply for these commodities, so the prospects for increasing farmer incomes are good. While the market may be firm the supply response is constrained by pests like, leaf miners, thrips, aphids and viruses that can wipe out a crop just before harvesting. In an effort to save their crops shallot farmers, for example, spray more than 20 times in a 60 day crop cycle. Not only is this unsustainable from an environmental perspective it is increasingly costly for growers in terms of their health and their pocket books.*

*For years farmers in other countries have been using Integrated Crop Management (IPM or ICM) techniques for controlling pests and disease. The technique involves monitoring the incidence of pests or disease during a crop cycle and then treating these, at the appropriate time and with appropriate control measure, to reduce crop losses to an acceptable limit. In many cases “beneficial” insects are introduced to combat the pest causing the greatest damage.*

*Even though this method has been tested in experimental farms and labs in Indonesia, its widespread use by farmers is limited. The main reason for this is that there are few “champions” actively supporting this adoption. The aim of this intervention is to sustainably introduce this method to 2,000 small holders in the chilli and shallot sectors, so that they can save 50% of their crop protection costs and achieve higher yields. The main partners or champions that have expressed an interest in this collaboration are Syngenta, Bayer Crop Science and Crop Life from the private side, and the IPB (Bogor Agricultural University) from the public side. Private input supply companies are very interested in this method because they know that for at least 7 years (the time it takes to test a chemical for eventual use in the field), they do not have the chemical solutions to these problems and if farmers in these sectors go out of business they will eventually see a drop in sales of their other products. IPB is interested to test the commercial applications of the method.*

*In this case the intervention could involve:*

- *Examining the crop cycles of these two commodities (chillies and shallots) in a few locations in eastern Indonesia,*
- *Developing, with the private and public partners, a pest to beneficial interaction matrix for these crops,*
- *Designing a commercial IPM solution based on cultural, chemical and biological control practices (hygiene, isolation, pheromone traps etc.),*
- *If needed, establishing small facilities to produce the appropriate beneficials in controlled conditions,*
- *Piloting these solutions with commercial farmers that are supported by trained agronomists from both the university and private sector,*
- *Scaling up these solutions through a well-planned and coordinated promotional program funded by the private sector partners and supported in its implementation by demonstration plots organised by these private sector firms.*

*The main costs of this intervention would be technical assistance in the intervention design and implementation, personnel to be engaged in the field work, lab costs and personnel and public relations for the solutions’ rollout. These costs would be split three ways between ARISA, the private sector partners and the university involved. The estimated time frame for this would be three years.*

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

The sequencing of ARISA's project delivery is summarised below:

1. A strategy for identifying relevant private sector partners is developed
2. A preliminary screening of prospective RIs is conducted
3. Expressions of interest (EOIs) will be sought from prospective RIs and private firms for interventions that meet overarching AIP goals e.g. feasibility of intervention to reduce poverty, numbers of smallholder farmers that could potentially benefit etc.
4. Partner RIs and/or firms who will develop proposals are selected for 1) building institutional business capacity and 2) capacity for collaborative adaptive research projects within agricultural innovation systems. Both sides will be assisted by the project in the preparation of their proposals.
5. Baseline needs assessment of business capacity in RIs is conducted.
6. Two to three rounds of a grant proposal selection to support for collaborative projects will be implemented
7. Proactive capacity strengthening in an agricultural innovation systems approach with RI/private firm partners and stakeholders.
8. Development of dissemination strategies to support engagement with a wide set of research, business and policy stakeholders and share experiences from project activities on impact, value, incentives and changing institutional roles in innovation.
9. Support for an emergent opportunity fund to facilitate potential future RI partners, unexpected business or research opportunities or opportunities to embed principles in broader institutional landscape.

A Gantt chart for indicative project scheduling appears as Annex 3.

### **4.3.1 Selecting partners**

The Project will first identify research institutes and private sector firms to be key partners in interventions for the four year project. The project aims to have a portfolio approach and reserves the right to deepen, lighten or cease its engagement with an RI depending on their level of commitment and engagement in the process.

#### **Process for eliciting EOIs**

A preliminary mission will be conducted within three months of the project's start. The primary purpose of this mission will be: a) to develop a strategy for identifying suitable private sector firms; and b) to engage with research institutions with activities in eastern Indonesia, to introduce the scope of the Project. At this time interest will also be gauged from any known or outstanding firms or RI that evidently have suitable intervention ideas.

The shortlist of collaborations will be compiled from three sources: a) credible offers from private firms that are clear on the RI with whom they wish to partner; b) credible offers from RIs that have already identified their private sector partner and c) from the project's own matchmaking capacity between firms it knows and the RIs it knows are in search of partners in the private sector.

Eligibility criteria for RIs will include:

- A willingness to reach out to the private sector and collaborate on the commercialisation of innovation.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

- Either located in eastern Indonesia (East Java, NTT & NTB) or with significant research capacity in the region.
- A willingness and a plan for developing institutional capacity for market facing research and collaboration.
- Ability to propose innovation ideas and partnership opportunities with relevant agribusinesses.
- Infrastructure and human capacity to conduct agricultural innovation systems research.
- Willingness to co-invest (in-kind or financially) in their institutional development and in collaborative partnerships.

Eligibility criteria for private firms:

- An interest to commercialise an innovation that fits the project's criteria.
- A willingness to co-invest with RIs in the development and dissemination of the innovation.
- The capacity to participate in the collaboration both in the innovation's development as well its dissemination.

Appropriate templates will be developed by the project team, incorporating feedback from RIs and firms. The call for EOIs will be released on commencement of the project when a Grants Manager is in place. Successful RIs and firms will be selected over two to three rounds by the ARISA's Project Coordination Committee (PCC).<sup>17</sup>

### **Development of business and research proposals**

Selected RIs will receive technical assistance for strengthening research and business capacity. Capacity to the firms will be delivered through the individual grants and will be specific to the innovation being promoted.

The selection process will involve the development and use of scoring protocols to help assess the relevance of proposed innovation grants to poverty reduction in targeted farming communities. On selection, a full proposal will be requested from either firms or RIs, outlining: 1) an institutional/firm strategy to develop private sector outreach functions (with acknowledgement that these strategies will evolve during the course of the program as engagement with private sectors progresses); and 2) research concept notes for near market-ready innovations that will form the basis of the pilot collaborative grants.

Technical assistance will be offered to assist in developing these proposals and again, CSIRO will develop templates and guidelines to support the process. Having presented initial innovation concept notes to the PCC, partner RIs or firms will develop (with the support of the project) full proposals with their private sector or RI partners, and the target smallholder community, for promising agricultural innovation systems development concepts. Mentoring, guidance and financial support can be provided to support this development.

Indicative components of grant proposals will include:

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<sup>17</sup>For ARISA's governance structures, see Section 5.4



## *Applied Research and Innovation Systems in Agriculture (ARISA)*

- Partnership to include public RI and at least one (preferably more) private sector actors,
- Robust, jointly developed business cases, articulating anticipated benefits for each partner,
- Joint applied innovation plan that leads to a marketable innovation and development outcomes,
- A clearly defined pathway for outreach to 1000+ smallholder farmers in eastern Indonesia, with well-articulated and anticipated livelihood or income benefit,
- Significant but negotiable cost-share arrangement (between RI, industry and grant),
- Measurable and attributable impact strategy on farm incomes (within 2-3 years), with plans for collecting baseline information,
- Well-defined quantitative and qualitative milestones (with stop-go points).

### **4.3.2 Building business capacity in RIs**

On initial selection, a baseline needs assessment will be undertaken with the partner RIs and CSIRO. This will form the foundation of the capacity support package for the start of the program. It is anticipated that ongoing critical reflection will be undertaken to monitor progress, identify and address unanticipated capacity gaps and support transition to higher capacity functions as a result of the collaborative engagement.

A one-size-fits-all approach is not envisaged across the partner RIs. A tailored approach is preferred, with opportunity provided to build a community of practice and cross-institutional learning amongst the initial RIs and then to other RIs with activities in-region. The most appropriate capacity provider will be selected in response to the requirements of partner RI staff and teams. It is anticipated that assistance will be drawn from CSIRO and Indonesian and regional providers.

Indicative activities may include:

- An annual CSIRO-hosted study tour on research management and commercialisation for key personnel in partner RIs,
- Project specific business development mentoring by matching CSIRO business units with university business units,
- Mentoring and targeted additional learning in Indonesia for emerging capacity constraints like marketing, negotiation skills, contract data management,
- Training in challenge workshops (innovation platforms) to reach common understanding of constraints and solutions for mutual benefit,
- Experiential coaching in design, management and delivery of collaborative multi-stakeholder research projects,
- The developing of systems for measuring the results of applied and adaptive research, in agriculture, on farmer productivity,
- Provision of a catalyst for university community of practice and learning.

Key outputs from this capacity building will be technical analyses, reports and journal papers, co-authored with Indonesian and Australian partners, providing narratives from the initiative and a summary of the collective learning from undertaking this work. The expected result will be a

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

community of practice in Indonesia and Australia who develop and publish their work on agricultural innovation systems and are recognised internationally for this approach.

### **4.3.3 Flexibility, opportunities and scale**

This design allocates approximately AUD100,000 for activities that offer opportunities that align with the program goals during the course of the project. Examples might include additional market analysis, support for a new RI to engage with the project process, support for additional collaborators on an existing research project or support for potential RI partners that were not successful in securing a grant in the initial funding rounds. It is the responsibility of the PCC to identify and prioritise the emergent activities by mid-way through the project term.

### **4.3.4 Exit strategy**

The aim of AIP-Rural program is to stimulate systemic change. The ARISA project contributes to this goal by providing a catalyst – in terms of capacity, opportunity and a funding mechanism – for effective collaboration between public and private players on innovation generation and dissemination for the benefit of smallholder farmers. The potential for system change can be assumed when the model is copied, improved, expanded and embedded in the Indonesian innovation system and supported by relevant changes in the wider policy and enabling environment.

While the ARISA project is too small to effect systemic change on its own, it is designed with an exit strategy, i.e. sustainable benefits, in mind. Building business capacity and processes in the project's partner RIs will better equip them to engage productively and proactively with external business, while the experience of funded collaborations during the life of the project will enable critical reflection and adaptation to align with institutional direction and mandate.

Through well-designed research and innovation activities with RIs, agribusiness will realise the project-specific business opportunities and this collaborative experience will fuel further associations (where there are options to do so) under an improved RI business model.

The project will also encourage replication or 'crowding in' which is expected to occur when RIs are made aware of the academic and impact benefits from new models of engagement, and when agribusinesses see business and collaborative opportunities and want to engage with RIs. Both will be encouraged by the project and supported by the "emergent opportunities fund" where feasible.

Expansion beyond project partners will depend on the effective promotion of case studies of successful collaborations in which the benefits to firms, RIs and smallholders will be made explicit. This will be supported by the project through dissemination networks, media, conferences, events and forums (e.g. university-industry workshops) and industry associations (e.g. PISAgro). The project also envisages an annual workshop to which non-target business, RIs and policy stakeholders will be invited as a way to promote the model and to be.i.in a community of practice in research-business engagement processes.

Ultimately, the exit strategy will be successful when the project's funding mechanism has been replaced with an appropriate Gol system. There is a risk that CSIRO may become a market driver for collaborative innovation research (i.e. a provider of technical assistance to RIs). Proactive engagement and advocacy with policy makers (particularly change agents in RISTEK, Ministry of Agriculture and Ministry of Education and Culture) during the life of the project will be critical in

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

order to a) identify the natural home for this funding model beyond the life of the project and b) to design the support needed for adoption and adaptation of this funding system into the GoI institutional framework.

### **5 Implementation arrangements**

#### **5.1 Duration**

The Project is designed to run for four years, and is expected to start in the second half of 2014. ARISA will be independently assessed through a mid-term review, towards the end of its second year of operation. If results are promising and potentially cost effective, a second phase of three to five years will be considered.

The criteria of success for this project will be the volume and quality of innovations reaching farmers and the impact that these innovations have on farm level competitiveness. The development and dissemination of these innovations will come through collaborations between research institutions and private firms. Indicators to monitor this impact have been formulated and are specified in Section 5.6.

The first round of grants (at least 2) for interventions meeting selection criteria will be disbursed by month 8 of the project. The second round of grants (at least 3) will be approved but not necessarily disbursed by month 12. 60% of all intervention grants will be disbursed (against agreed milestones which are specific for each intervention) by month 18 of the project. In month 24 the project will be subject to a mid-term review at which time decisions will be made on future resource allocations.

#### **5.2 Location**

AIP-Rural's geographic mandate includes five provinces in eastern Indonesia: NTT, NTB, East Java, Papua and West Papua. PRISMA, the first and largest project of AIP-Rural, started in November 2013. It will take a phased approach to its geographic deployment; phase 1 involves implementing interventions in NTT, NTB and East Java while investigating and designing interventions for Papua and West Papua. Phase 2 involves continued implementation of interventions in the first three provinces and at the same time initiating operations in Papua and West Papua.

The ARISA project will take a similar approach, starting in the three provinces of East Java, NTB and NTT while investigating the potential for expansion to Papua and West Papua. Because of the relatively short duration of the project and its need to demonstrate its proof of concept, this project will concentrate implementation of up to 10 interventions in the three above mentioned provinces.

During this three year period, and in anticipation of a second phase, the project will investigate potential partners in the private and public sectors in Papua and West Papua, with a view to the identification of future activities in these provinces.

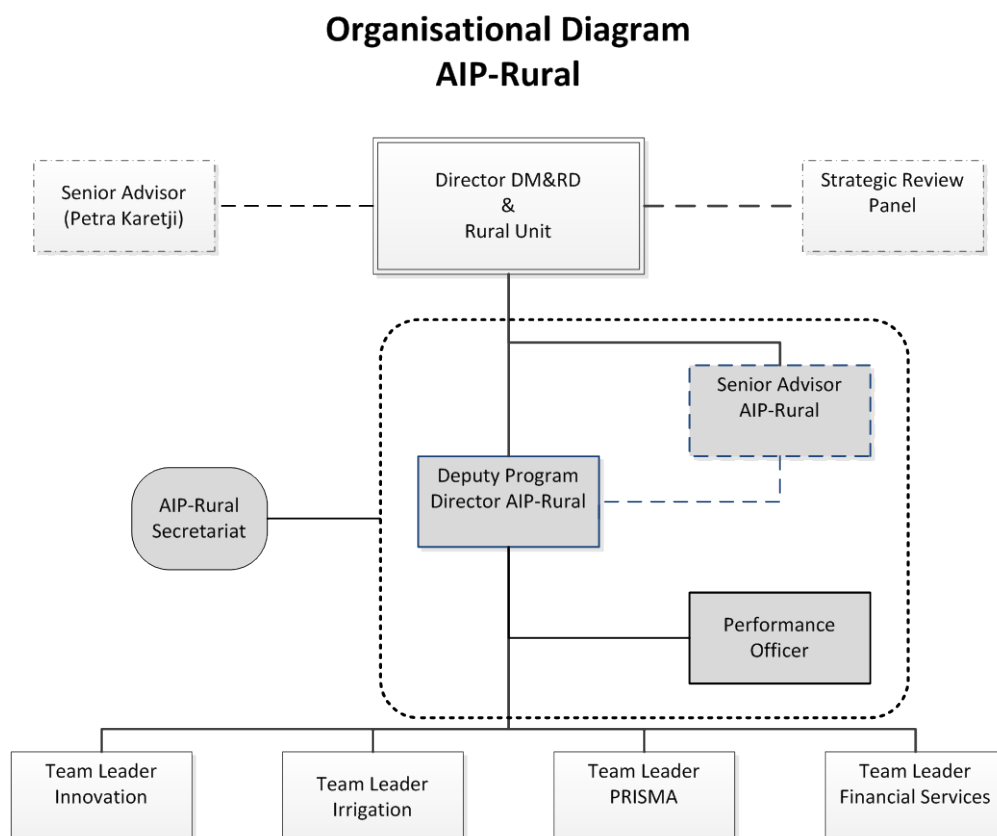
#### **5.3 Governance**

AIP-Rural currently falls under the Disaster Reduction and Rural Development section of DFAT Jakarta. The program will be led on a day to day basis by AIP-Rural's Deputy Program Director, supported by a Senior Advisor. These last two positions – housed within the AIP-Rural Secretariat – have been engaged directly by DFAT specifically for the purposes of a) completing the AIP-Rural's

## Applied Research and Innovation Systems in Agriculture (ARISA)

design, and b) overseeing program implementation through projects which, for the most part, will be either be delegated to other international or Australian public organisations or commissioned to managing contractors.

Decisions on the relative allocation of resources within these components will be driven by four criteria: pro-poor relevance, growth potential, scope for interventions and value for money. A Strategic Review Panel (SRP) has been created to support AIP-Rural management. The purpose of the SRP is to provide advice on the coherence of the program's differing projects.



**Figure 6. Governance of AIP-Rural**

Each AIP-Rural project component (TIRTA, ARISA, Financial Services, and PRISMA) will have its own separate governance structures and Government of Indonesia counterpart. For the ARISA project, the likely counterpart agency is BPPT. Within BPPT, the most likely connection is with the Life Sciences Unit.

A Project Coordination Committee (PCC) will be formed comprising a BPPT representative (either from the Life Sciences or External Collaboration units, the Deputy Director of AIP-R, the CSIRO Team Leader and the Grants Manager. The mandate of the PCC is to develop an operational plan, to review and report against that plan and to provide appropriate feedback to the Government of Indonesia on project progress and impact.

The co-location of key project staff with other AIP-Rural component teams in Surabaya will support effective coordination and communication between AIP-Rural program components. In addition, a

## Applied Research and Innovation Systems in Agriculture (ARISA)

CSIRO representative will sit on any AIP-Rural coordinating committee to enable information flow between ARISA, other AIP-Rural projects and DFAT management and stakeholders.

### 5.4 Management

The roles and responsibilities of the proposed ARISA team are outlined below with the management structure illustrated in Figure 7. It is expected that the team will have a track record in the commercialisation of research in low-income economies and be experienced in brokering public-private partnerships. It is this feature of the project which distinguishes it from other past overseas engagements managed by CSIRO.



Figure 7. ARISA Management Structure

**The Project Leader** will be an Australia-based CSIRO staff member who will be responsible for the overall management of the project and its team of Indonesia-based and Australia-based staff. The Project Leader will chair the Project Coordination Committee and be responsible for the strategic orientation of the project, oversee establishment of the project's results measurement framework and quality assurance and coordinate internal and external engagement.

**The Grants Manager** will be an internationally recruited project team member and the In-Country Team Leader, based in Surabaya. Under the direction of the Project Leader, the Grants Manager will be responsible for establishing and managing the project's small grants scheme, including negotiation between project partners, assessment of project proposals and capacity needs and day-to-day supervision of in-country project team. In addition this person will be responsible for supervising the establishment and operations of the project's results measurement system in compliance with the DCED Results Measurement Standard.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

**The Finance, Administration and Personnel Manager** will be based in the in Surabaya and be responsible for project operations under the Project Leader. This position will cover all aspects of financial management, including procurement, administration and personnel management.

**The Results Measurement Manager** will be based in Surabaya and will be responsible for the implementation of the project's results measurement system, under the Project Leader and day-to-day supervision of the Grants Manager. This will include implementing and ensuring compliance of an effective results management system, overseeing capacity building in measuring and attribution, reporting on portfolio quality and promoting project impact.

**The Project Administration Support Officer** will be based in Surabaya and support the project team in Australia and Indonesia and report to the in-country Team Leader (Grants Manager).

**The Country Relations Manager** is a part time internationally recruited CSIRO staff member, based in Jakarta. The position will be the key liaison between CSIRO, Government of Indonesia, project partners and broader industry players.

Refer to Annex 5 for more detailed Terms of Reference for these positions.

### **5.5 Procurement**

It is envisaged that the ARISA project will be managed by CSIRO Australia. CSIRO is Australia's national science agency and is recognised as a world leader in tropical and semi-arid farming systems research. CSIRO has a strong history of research for development, innovation systems research and adaptive project management in Southeast Asia and sub-Saharan Africa.

Procurement of goods, services and short term consultancies for the project will follow CSIRO's Procurement Policy, which adheres to the Commonwealth Procurement Guidelines. Key principles for CSIRO's procurement are value for money, effective competition, economic and ethical use of resources, accountability and transparency and risk management.

The grant scheme will be administered after due diligence is sought in the targeted partner research institutes. It is envisaged that Finance, Administration and Personnel Manager will work closely the Country Relations Officer and the Grants Manager to ensure appropriate procurement procedures are followed for the project.

CSIRO will engage the Grants Manager as a contractor to CSIRO. Employment of local staff in Indonesia (Results Manager, Finance manager, Admin Assistant, Driver) will be via a local Indonesian contracts management company who can organise employment contracts. It is also envisaged that this contract management company will have the ability to administer grants and other agreements with Research Institutions and Private Sector companies. The job descriptions for local staff will be developed by CSIRO and will form part of the employment contract. These local positions will be advertised in Indonesia via a competitive process. The Grants Manager will have the responsibility for managing local staff.

The project team will be co-located with DFAT and the AIP-Rural team in Surabaya. A service level agreement will be negotiated with DFAT for rent of office space and furniture in Surabaya.

# Applied Research and Innovation Systems in Agriculture (ARISA)

## 5.6 Monitoring and evaluation

AIP-Rural's senior management is using a common results measurement framework for all components of the program. This framework is the DCED's Results Measurement Standard. This standard lays out guidelines for establishing a results measurement system for a project of this nature and identifies control points and compliance criteria for the implementation of the system so that it can be audited by a trained third party. The framework also lays out the principles for assessing systemic change (replication, copying and crowding in). In addition to the compilation of impact the system will enable simple value for money calculations to be made on each of the interventions and for the project as a whole.

Annex 4 illustrates the Milestone Matrix for this project. As stated previously, the two main results areas for this project will be: *private firms increase investment in adaptive research to develop commercially viable products, practices and technologies that benefit farmers* and *public research institutions increase investment in adaptive research to develop commercially viable products, practices and technologies that benefit farmers*. Each of the up to 10 pilot intervention must have a results chain that aligns with the goal of AIP-R, even if the pathways to impact are different.

Key indicators that will be assessed in this project and which are consistent with the overall Theory of Change for AIP-R will be:

- Net additional and attributable income changes of small farmers using project supported innovations,
- The outreach or number of farmer beneficiaries using these innovations,
- Significant behavior changes of these farmers leading to their income changes,
- The number of active collaborations between RIs and private firms, and the number of innovations disseminated,
- The level and percentage of additional investments stimulated by either RIs or the private sector in the development or dissemination of supported innovations,
- The business turnover of private sector collaborating partners, related to the dissemination of the supported innovations,
- Signs of changed behavior in the RIs with regard to their capacity and willingness to collaborate with private sector partners,
- Any significant policies, regulations, procedures changed within the agricultural innovation system to improve the enabling environment for public-private collaborations,
- Any potential copying of the supported or adapted model by other RIs and their agribusiness partners.

Because the results measurement system will be common to all components of AIP-Rural and since all key management personnel of AIP-Rural will be co-located in Surabaya, it is anticipated that, in addition to collaboration with results measurement colleagues in other AIP-Rural projects, regular technical support will be available to project personnel responsible for measuring results. This should enable the more efficient use of short term expert support for the establishment and implementation of the system. In terms of key milestones for the development of the system, the following will be essential:

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

- By at least the end of month six an appropriate short term consultant should have identified key areas of the projects results measurement system that require improvement before an audit.
- By the end of month 12 the project should be ready for an 'in-place' audit and should have recruited an auditor to verify that the system complies with the DCED standard.
- By the end of month 24 the project should be ready for a full 'in-use' audit so that key results are verified as plausible six months prior to the completion of the project.

As a project that focuses on innovation systems and their ability to generate sustainable outcomes ARISA will undertake research on the facilitation process and its efficacy to deliver outcomes that impact on farmer incomes. Such research will include: effective brokering connections, quantifying the risks and returns from selecting innovations, adaptation and testing of these innovations in local environments, understanding the barriers to widespread adoption, measuring impacts within the project's timeframe and beyond, and disseminating evidence on how public-private partnerships in this area can generate results.

Another layer of AIP-R monitoring for this project should be noted. This is provided by the AIP-R Secretariat made up of the Deputy Program Director of AIP-R and the Senior Adviser. Aside from the project's own backstopping from CSIRO and in-country coordination through its PCC, AIP-Rural will assess and monitor progress on a quarterly basis and review resource allocations on an annual basis.

### **5.7 Risk management**

The key risks in ARISA encompass those encountered under the full AIP-Rural program and so their identification and mitigation can extend to this project. In addition there are project-specific risks that exist with research for development projects. Key risks include:

- CSIRO confronts difficulties in establishing an Indonesian office and managing project operations with the Government of Indonesia and Research Institutes;
- Delays in appointing the Grants Manager. This is a critical in-country, senior role and the position will advertised with an international recruitment likely.
- The project's theory of change for public-private partnerships is not supported or is not amenable to Research Institutes in Indonesia;
- Private local investors are not attracted to join the small grant facility;
- The research outputs do not lead to development outcomes at scale;
- The development agenda of DFAT and AIP-R overrides the research for development agenda of CSIRO and the Indonesian Innovation Systems; and
- Reputations of Australia, CSIRO, DFAT or a core Indonesian partner is damaged by events during implementation.

Strategies to mitigate these risks are formulated and presented on the following pages.



## Applied Research and Innovation Systems in Agriculture (ARISA)

Figure 7: Risk assessment and mitigation strategies

Risk Event	Program Impact	L	C	R	Risk Mitigation	Responsibility
<b>CSIRO confronts difficulties in establishing an Indonesian office and managing project operations with the Government of Indonesia and Research Institutes</b>	<p>Changes subsequent to the 2014 Indonesian elections make it difficult to reach an agreement with Gol</p> <p>CSIRO does not have the administrative systems in place in Indonesia to support project implementation.</p> <p>RIs become uncooperative and reduce participation in interventions.</p>	3	4	E	<ol style="list-style-type: none"> <li>1. CSIRO leverages the relationship management efforts of AIP and DFAT.</li> <li>2. CSIRO establish an IRO with CSIRO Executive support and staffed with experienced liaison and procurement officers who are supported by CSIRO.</li> <li>3. Build good relationships with senior management and collaborating researchers in RIs to ensure local support for the project.</li> </ol>	<p>Deputy Program Director AIP-Rural</p> <p>CSIRO Business Development Manager</p> <p>Project Team Leader</p> <p>In-country Relationship Manager</p>
<b>Delays in appointing the Grants Manager</b>	Delays in establishing the grants and getting the project proper underway	3	4	E	<ol style="list-style-type: none"> <li>1. Begin canvassing for possible candidates through an EOI process before the project formally commences i.e. during the contracting phase</li> </ol>	<p>Senior Advisor AIP-Rural</p> <p>Project Team Leader</p> <p>In-country Relationship Manager</p>
<b>The project's theory of change for public-private partnerships is not supported or is not amenable to Research Institutes in Indonesia</b>	<p>Inability to establish small grants scheme via RIs</p> <p>Below quota uptake on offers of capacity strengthening activities</p>	2	4	H	<ol style="list-style-type: none"> <li>1. Pre-project mission by CSIRO to promote ARISA to RIs and scope out prospective partners.</li> <li>2. Include option of CSIRO working directly with private sector partners</li> <li>3. Include flexibility in grant disbursement for emergent opportunities</li> <li>4. Design capacity building programs with stakeholders</li> </ol>	<p>Project Leader</p> <p>Grants Manager</p>

## Applied Research and Innovation Systems in Agriculture (ARISA)

					5. Review the project in month 12 to reassess the project's demand from RIs and the private sector	
<b>Private local investors are not attracted to join the small grant program.</b>	<p>Difficult to find private sector partners willing to work with the program</p> <p>The effectiveness of interventions is diminished.</p>	4	4	E	<ol style="list-style-type: none"> <li>1. Pre-project mission by CSIRO to promote ARISA identifies likely private sector partners</li> <li>2. Grants can include disbursement of funds for private sector investments in research capacity</li> <li>3. Grants to support largely existing initiatives being progressed by the private sector.</li> </ol>	<p>Project Leader</p> <p>Grants Manager</p>
<b>The project outputs do not lead to development outcomes at scale.</b>	<p>Few smallholder farmers are engaged in grant projects</p> <p>Selected innovations do not produce on-farm impacts or have barriers to adoption.</p> <p>The project fails to reach its development target of 10,000 farmers</p>	4	5	E	<ol style="list-style-type: none"> <li>1. Selection criteria for grants will include the potential impacts achieved at scale and the contribution of private sector investment.</li> <li>2. Each grant proposal will construct a business plan and impact logic prior to commissioning</li> <li>3. A project priority is to build the capacity of RIs to engage constructively with private investors and deliver impacts</li> </ol>	<p>Project team Leader</p> <p>Grants Manager</p>
<b>The development agenda of DFAT and AIP-R overrides the research for development agenda of CSIRO and the Indonesian Innovation Systems</b>	<p>Loss of interest from CSIRO and Indonesian researchers in project activities and deliverables</p> <p>Deteriorating relationships between DFAT, AIP-R, RIs and CSIRO.</p>	3	2	L	<ol style="list-style-type: none"> <li>1. ARISA design and implementation plans developed collaboratively between CSIRO and AIP-Rural's Secretariat.</li> <li>2. Proactive communication is practiced</li> </ol>	<p>Project team Leader</p> <p>CSIRO researchers</p>

## Applied Research and Innovation Systems in Agriculture (ARISA)

<b>Reputations of Australia, CSIRO, DFAT or a core Indonesian partner is damaged by events during implementation</b>	Partnership unable to deliver planned results with available resources	2	2	L	<ol style="list-style-type: none"> <li>1. ARISA uses accountability and transparent budget and resource allocation decisions</li> <li>2. Build on CSIRO reputation in research for development</li> </ol>	Project team Leader
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Legend: L=Likelihood, (5 = almost certain, 4 = likely, 3 = possible, 2 = unlikely, 1 = rare); C = Consequence (5 = severe, 4 = major, 3 = moderate, 2 = minor, 1 = negligible) R= Risk Level (E = extreme, H = high, M = medium, L = low)

## **6 References**

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## **7 Annexes**

- Annex 1**      Connections between innovation market chain and broader agricultural market
- Annex 2**      Government of Indonesia stakeholder map for agricultural innovation
- Annex 3**      Project Gantt Chart
- Annex 4**      Project Milestones
- Annex 5**      Terms of Reference for non-CSIRO or new positions

Annex 1 Connections between innovation market chain and broader agricultural market

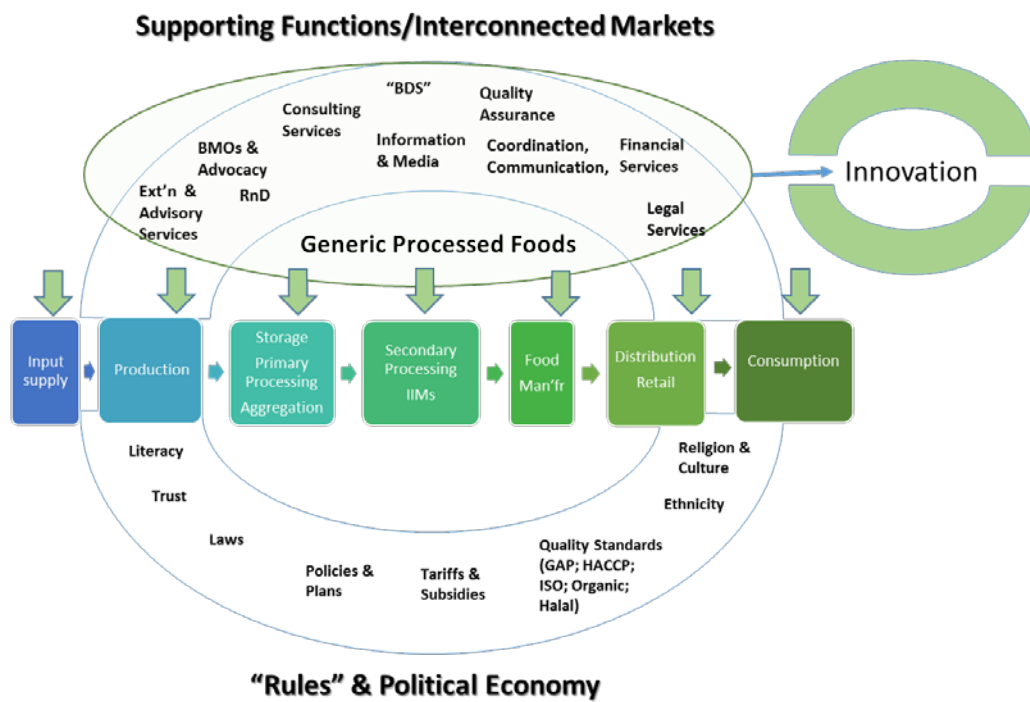


Figure a. Generic agricultural market chain

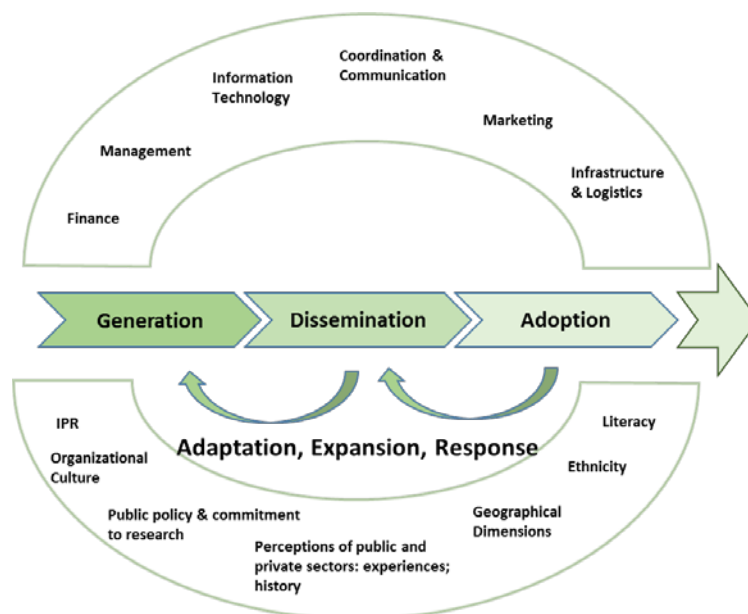
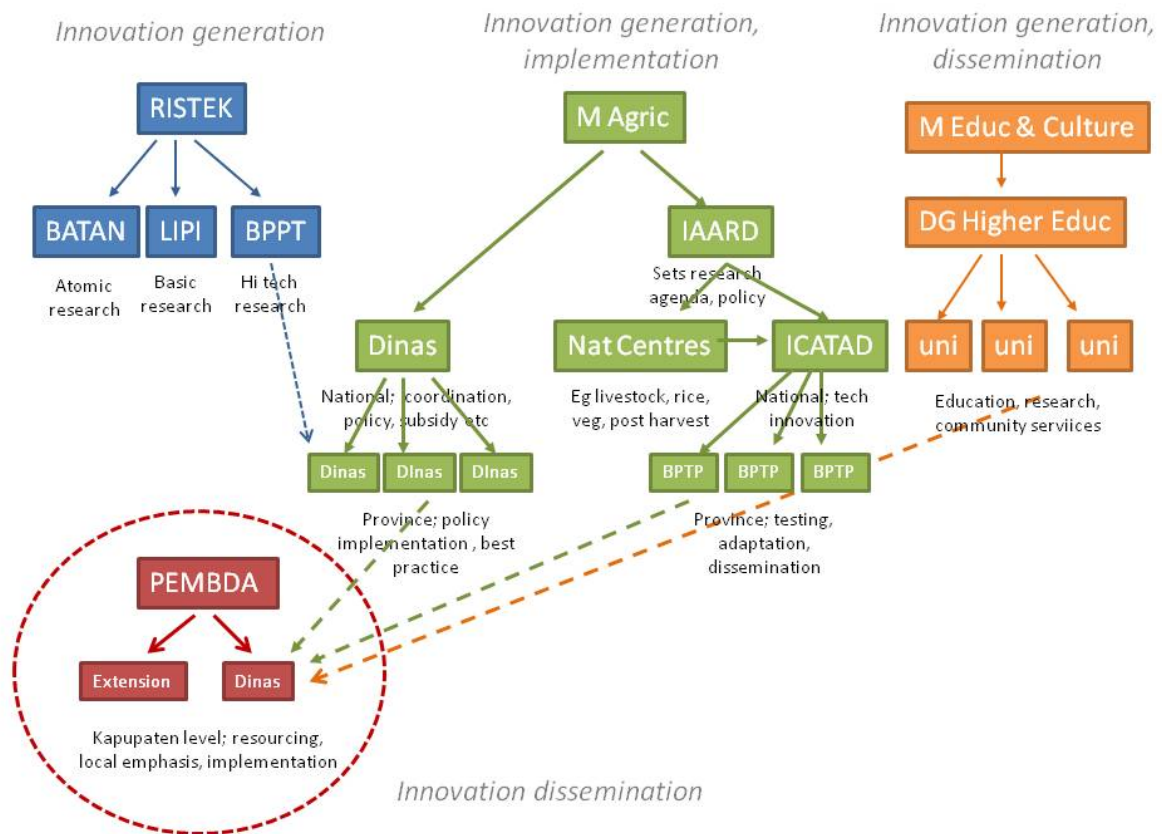


Figure b. Innovation market chain.

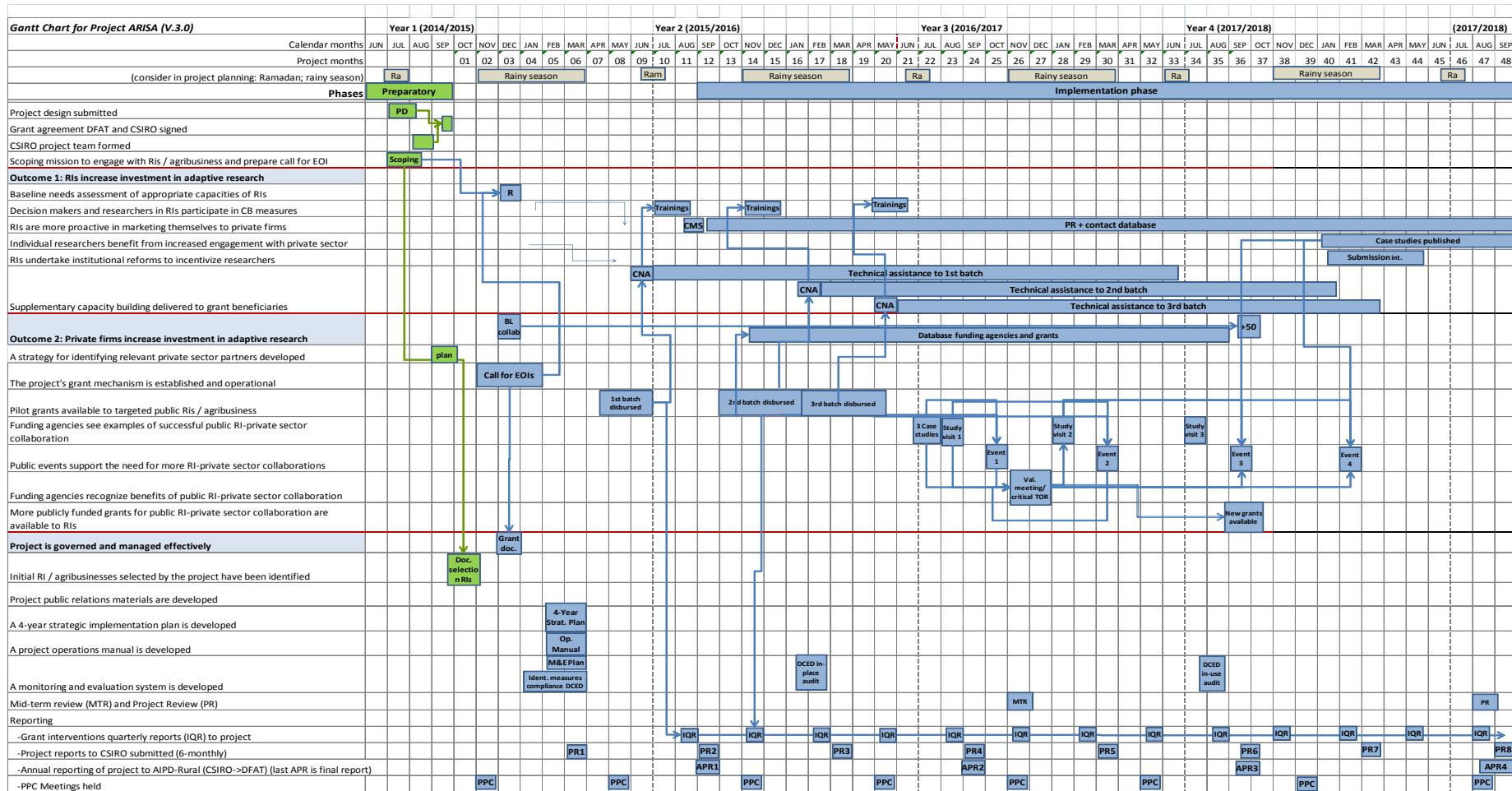
# Applied Research and Innovation Systems in Agriculture (ARISA)

## Annex 2 Government of Indonesia stakeholder map for agricultural innovation



# Applied Research and Innovation Systems in Agriculture (ARISA)

## Annex 3 Project Gantt chart





## Applied Research and Innovation Systems in Agriculture (ARISA)

### Annex 4 Project Milestones

Logframe Terms	Indicators							
	Month 1-6	Month 7-12	Month 13-18	Month 19-24	Month 25-30	Month 31-36	Month 37-42	Month 43-48
<b>Goal:</b> Farmers from eastern Indonesia increase their incomes from agriculture								At least 10,000 participating smallholders in Eastern Indonesia increase their incomes from agriculture by at least 30%
<b>Outcome at the Farm Level:</b> Farmers are effectively using the competitiveness enhancing innovation							At least 10,000 participating smallholders benefit (improve competitiveness) from the adopted project sponsored innovations	
<b>Outcome at the Farm Level:</b> Farmers adopt competitiveness enhancing innovation						At least 10,000 participating smallholders adopt project sponsored innovations		
<b>Intermediate and Systemic<sup>1</sup> Outcomes:</b> More and better innovations are available to smallholders				At least 4 new or improved products, practices or technologies are introduced by private firms to farmers in EI	At least 8 new or improved products, practices or technologies are introduced by private firms to farmers in EI			At least 1 new innovation, matching project criteria, has been introduced without project support to farmers in eastern Indonesia

## Applied Research and Innovation Systems in Agriculture (ARISA)

<p><b>Intermediate and Systemic<sup>1</sup> Outcomes:</b> Private sector/research institution collaborations</p>	<p>At least 2 RI-PS collaborations are negotiated and signed</p> <p>At least 2 credible business plans are elaborated between RIs and private sector collaborators</p>	<p>At least 4 RI-PS collaborations are negotiated and signed</p> <p>At least 4 credible business plans are elaborated between RIs and private sector collaborators</p>	<p>At least 8 RI-PS collaborations are negotiated and signed</p> <p>At least 8 credible business plans are elaborated between RI and private sector collaborators</p> <p>At least 4 collaborations are operational and producing results</p>	<p>At least 8 collaborations are operational and producing results</p> <p>The number of requests made by private firms to participating RI has increased by 25% in the last 12 months</p>	<p>At least 80% of participating RIs make at least 1 significant institutional change to facilitate or incentivize collaborations in applied and adaptive research with the private sector</p>	<p>Participating RIs have at least 2 more potential collaborations (fitting the selection criteria) in their immediate pipeline</p> <p>The number of requests made by private firms to participating RI has increased by a further 25% in the last 12 months</p>	<p>At least 2 other non-participating RIs receive assistance from participating RIs and/or CSIRO for the development of similar collaborations</p>	<p>Participating RIs have an additional 2 potential (total of 4) collaborations (fitting the selection criteria) in their immediate pipeline</p> <p>The number of requests made by private firms to participating RI has increased by a further 25% in the last 12 months</p>
<p><b>Intermediate Outcome:</b> Private sector firms increase investment in adaptive research to develop commercially viable products, practices and technologies that benefit farmers</p>	<p>At least 4 firms confirm their interest in collaborating by month 3 on innovations that meet the criteria of the project</p>	<p>At least 8 firms confirm their interest in collaborating by month 9 on innovations that meet the criteria of the project</p>	<p>Participating private firms commit to financing 50% of their intervention costs</p>		<p>At least 6 of the 8 private sector partners express satisfaction with their collaborations</p>	<p>At least 6 participating private firms have financed 30% of their intervention costs</p>	<p>At least 4 private sector firms are reporting continuous and increasing revenue from their project innovations</p>	<p>Participating private firms have financed 50% of their intervention costs</p> <p>At least 10 new firms have approached either the project of the RIs expressing a willingness to invest in agricultural innovations</p>
<p><b>Intermediate Outcome:</b></p>	<p>At least 3 credible RIs expressed their</p>	<p>At least 6 credible RIs</p>	<p>Participating RIs commit to</p>	<p>At least 5 senior staff members in</p>	<p>80% of participating RIs have developed</p>		<p>At least 6 researchers from</p>	<p>80% of the participating RIs</p>

## Applied Research and Innovation Systems in Agriculture (ARISA)

<p>Research institutions increase investment in adaptive research to develop commercially viable products, practices and technologies that benefit farmers</p>	<p>willingness to collaborate with the project and to allocate resources for this purpose</p>	<p>expressed their willingness to collaborate with the project and to allocate resources for this purpose</p>	<p>financing 30% of their intervention costs</p>	<p>each of the RIs attend at least 4 days of appropriate capacity building in areas such as: business planning, marketing, facilitating business forums, the design of collaborations etc.</p>	<p>a communications strategy and materials to attract co-investment in agricultural research from the private sector</p>		<p>the RIs publish case studies on the impact of their collaborations</p> <p>At least 1 publication on RI-PS collaboration from each of the targeted RIs is submitted for international publication</p>	<p>have taken measurable steps towards increasing their investment in applied and adaptive agricultural research</p> <p>A further 2 RIs have expressed their willingness to invest in a further phase of the project</p>
<p><b>Management Outputs:</b> The project is governed and managed effectively</p>	<p>Assessments of technical market oriented capacities (human and institutional) that are needed in the RIs for improved collaborations in applied and adaptive research are conducted and shared</p> <p>A project website with the project's offer/application form is operational by month 3</p> <p>A project operations manual is in use defining internal procedures for grant applications, grant management and</p>	<p>An Annual Progress Report, and annual Work Plan complying with guidelines of AIP-Rural, is completed</p> <p>An "in place" or preparatory audit has been conducted by a DCED accredited auditor</p> <p>One study aimed at policy makers which identifies significant opportunities for RI-PS collaborations is conducted and shared with</p>	<p>A further 6 credible RI or private firms have been assessed and ranked for their suitability to receive collaboration grants</p> <p>A Semester Progress report, complying with guidelines of AIP-Rural's Secretariat, is completed</p>	<p>An Annual Progress Report, and annual Work Plan complying with guidelines of AIP-Rural, is completed</p> <p>An "in use" audit has been conducted by a DCED accredited auditor</p>	<p>A Semester Progress Report, complying with guidelines of AIP-Rural's Secretariat is completed</p>	<p>An Annual Progress Report, and annual Work Plan complying with guidelines of AIP-Rural, is completed</p> <p>At least 4 public events aimed at decision makers have been conducted to present the results of collaboration case studies,</p>	<p>A Semester Progress Report, complying with guidelines of AIP-Rural's Secretariat is completed</p>	<p>An Activity Completion report, according to DFAT procedures is completed and accepted by AIP-Rural's Secretariat</p>

## Applied Research and Innovation Systems in Agriculture (ARISA)

	<p>financial management</p> <p>The project has identified a set of measures needed to comply with a DCED audit</p> <p>An inception report, complying with AIP-Rural guidelines is completed and approved by AIP-Rural's Secretariat</p>	<p>public officials</p> <p>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</p>						
<p>1 Systemic Outcomes are related to changes that enable more collaboration to take place in the future, without project support</p>								

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

### **Annex 5 Terms of Reference for key project personnel**

**Position Title** Project Leader (CSIRO CSOF8)

**Duty Station** CSIRO Research officer, Australia based

**Duration** Four years

**Duties** As a staff member of CSIRO, and for the purposes of the ARISA project, the Project Leader will report to the Theme Leader for the 'Partnering for International Food and Fibre Security Theme' under the CSIRO Sustainable Agriculture Flagship. The ARISA Project Leader will be responsible for the overall management of the project and its team of Australian-based researchers and Indonesian-based team members.

The Project Leader will co-chair the Project Coordination Committee (PCC), comprising a BPPT representative, the Deputy Director of AIP-R and the CSIRO Project Coordinator. The mandate of the PCC is to approve an operational plan and the reporting against that plan and to provide appropriate feedback to the Government of Indonesia on project progress and impact.

Specifically the Team Leader will be responsible for:

- The strategic orientation of the project to ensure that it is in line with the goals and methodologies of AIP-Rural and the ARISA project plans. Decision making on all interventions will be made against the criteria of: potential outreach, impact on farmer incomes, sustainability, research contribution and value for money.
- Overseeing the establishment and functioning of the project's results measurement system. This will entail: the preparation of a systems manual with guidelines and templates; the training of project staff, the quality control of all intervention reports and the aggregation of short and long term indicators.
- Establish and monitor project communication strategies including: the marketing of the project and its offer to Research Institutions, the private sector and public officials; assessing the attendance of appropriate stakeholders at project events; validating the nature of feedback from key stakeholders on the substance and clarity of the project's message.
- Overseeing, with support from the Administration, Finance and Personnel Manager, the quality assurance of all: recruitment, contracting, financial management and budgeting, and administrative support systems and activities;
- Prepare in collaboration with the DPD of AIP-Rural, all project related planning and reporting documents, such as: the Inception Report, Annual Implementation Plans, Risk Assessments etc. to ensure that they are in line with the AIP overall planning and reporting system.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

### **Qualifications**

#### Essential

- 10 or more years professional experience in international agricultural research for development,
- Demonstrated professional leadership and ability to lead a team of professionals and ability to coach and mentor more junior staff,
- At least 3 years experience in a management position in an agricultural research for development project, and
- Excellent verbal and written communication skills in English.

#### Desirable

- Experience in research for development projects that worked with smallholder farmers and public and private organisations in Indonesia,
- Familiarity with international donor systems and requirements particularly DFAT.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

**Position Title** Grants Manager (In-country Team Leader)

**Duty Station** Surabaya

**Duration** Four years

**Duties** Under the direction of ARISA Project Leader (CSIRO), the Grants Manager will be responsible for establishing and managing the ARISA small grants scheme. Specifically this person will handle:

- The negotiation between public RIs and private sector players to establish collaborative intervention with small farmers according to the selection criteria agreed upon by project management.
- The completion of technical and commercial assessments for proposed grant projects.
- Assessing the capacity needs of ARISA partners and assisting in the design of training programs that address capability gaps.
- Assessing the technical capacity needs of local private sector collaborators with a view to designing and delivering practical capacity building measures for them.
- Assessing the capacity needs of farmers involved in the ARISA interventions with a view to designing and delivering (in collaboration with local investors) training on those practices that are most likely to lead to productivity improvements.
- The day to day supervision of the in-country project team including: the allocation of interventions and targets, the monitoring of their intervention management plans, regularly assessing implementation progress, taking remedial action where necessary and conducting staff assessments on performance.

### **Qualifications**

#### Essential

- Ability and aptitude to work in an innovation systems environment involving the private sector and applied researchers from Indonesia and Australia
- Excellent facilitation/negotiation skills in unstructured situations with demonstrated success in delivering negotiated outcomes.
- Experience in establishing and administering small grant schemes
- An excellent and practical understanding of agriculture,
- A degree or commensurate diploma in agricultural science, business or a similar field, and

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

- Fluency in speaking, reading and writing in English.

### Desirable

- Exposure to smallholder farming and agri-business in an Indonesian context,
- Experience in engagement with business and commercialisation managers within the university sector
- A working knowledge of Bahasa Indonesia



## *Applied Research and Innovation Systems in Agriculture (ARISA)*

**Position Title** Results Measurement Manager

**Duty Station** Surabaya

**Duration** Four years

**Duties** Under the direction of the ARISA Team Leader the Results Measurement Manager will be responsible for the implementation of the project's results measurement system. Specifically this person will be responsible for:

- Introducing an effective Results Measurement System (see Results Measurement in AIP-Rural). This will include a results measurement manual, a capacity building program, and assessment and remedial action processes;
- Clearing all intervention concept notes before they are submitted for management approval to ensure that they meet the compliance criteria of: the project on impact, outreach, social inclusion, gender, and environment, value for money and the DCED Standard for Results Measurement;
- Overseeing regular capacity building measures of project staff to ensure that all implementation staff members are familiar good practices related to assessing impact and measuring attribution;
- Preparing quarterly reports for management on portfolio quality. This will include, in the early stages of implementation, intervention by intervention projections of outreach and impact and a risk assessment for each intervention so that management may make decisions on the retention, suspension or elimination of the intervention. As the portfolio evolves, this report will monitor the achievement of all interventions against project objectives of outreach, impact and sustainability;
- Guiding implementation personnel in the preparation of results measurement plans and the identification of attribution strategies with a view to the appropriate use of survey instruments, the commissioning of surveys and research, the processing of the results of these surveys and the identification of remedial action;
- Overseeing the process leading to the project's compliance with the DCED Standard for Results Measurement, including the formulation of relevant documentation, the organisation of mock audits and the eventual project audit by a certified DCED Results Measurement auditor; and
- In collaboration with the Team Leader, preparing: public presentations, case studies, articles and materials for the project website on project impact and how impact is assessed and used for decision-making in the Project.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

### **Qualifications**

#### Essential:

- 5 or more year's professional experience or equivalent in the use of quantitative methods,
- Experience developing monitoring systems for development projects,
- Familiarity with the DECD standard on impact monitoring for private sector development projects,
- A sound understanding of statistics and quantitative measurement through a variety of survey instruments and analysis techniques,
- Excellent verbal and written communication skills, and
- Fluency in speaking, reading and writing in English and Bahasa Indonesia.

#### Desirable

- Familiarity with international donor systems and requirements,
- Experience in working the agriculture sector.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

**Position Title** Finance, Administration and Personnel Manager

**Duty Station** Surabaya

**Duration** Four years

**Duties** Under the direction of the ARISA Team Leader the Finance, Administration and Personnel Manager will be responsible for project operations. Specifically this person will be responsible for:

- Project financial management including: establishing the project's chart of accounts; the preparation of monthly financial statements; the reconciliation of bank accounts; the preparation of budgets; financial reporting in compliance with DFAT standards; clearing payments; and the training of staff in necessary financial reporting systems and procedures.
- Administration including: the development of contracting templates for short term consultants, local employees and grants (when appropriate), to project stakeholders. The execution of all above mentioned contracts including compliance with contractual milestones and deliverables.
- Personnel management including: staff recruitment, selection and salary negotiations, monthly staff payments, and ensuring performance assessments are regularly conducted.

### **Qualifications**

#### Essential

- Relevant bachelor's degree or similar qualification in business or accounting,
- A minimum of 7 years of relevant work experience,
- A minimum 2 years of people management experience, including setting clear performance objectives, managing for results, giving and receiving feedback, performance evaluation and mentoring and coaching consultants/employees, and
- Good communications skills in English.

#### Desirable

- Minimum 3 years at a management level similar projects, or projects of another bilateral donor,
- Excellent verbal communication skills in Bahasa Indonesia,
- Knowledge of Indonesian public sector and experience working with government agencies,

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

- Experience working on Rural Development or Agricultural projects or initiatives.

## *Applied Research and Innovation Systems in Agriculture (ARISA)*

**Position Title** Country Relationship Manager (CSIRO CSOF7-8)

**Duty Station** Jakarta

**Duration** Four years

**Duties** As a staff member of CSIRO, and for the purposes of the ARISA project,

### **Qualifications**

#### Essential

- Excellent communication and relationship management skills,
- Fluency in speaking and reading Bahasa Indonesia, and
- A working knowledge of English.

#### Desirable

- Working experience in the project target area,
- Existing networks among public and private stakeholders East Java, NTT and NTB provinces.