



Capacity Building for Agricultural Research for Development

LESSONS FROM PRACTICE
IN PAPUA NEW GUINEA

Adiel N. Mbabu and Andy Hall

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ACRONYMS

ACIAR	Australian Centre for International Agricultural Research
ACM	Adaptive Collaborative Management
ACNARS	Australian Contribution to a National Agricultural Research System
ACR	Activity Completion Report
AIGF	Agricultural Innovations Grants Fund
AIGS	Agricultural Innovation Grant Scheme
AIS	Agricultural Innovation Systems
AKIS	Agricultural Knowledge and Information System
ARDSF	Agricultural Research and Development Support Facility
AR4D	Agricultural Research for Development
ASARECA	The Association for Strengthening Agricultural Research in Eastern and Central Africa
ASC	Advisory Selection Committee
ASSC	AIGS Scoping and Selection Committee
AusAID	The Australian Agency for International Development
BPNG	Bank of Papua New Guinea
CBO	Community Based Organisation
CCEA	Cocoa and Coconut Extension Agency

CCI	Cocoa Coconut Institute Limited
CCRI	Cocoa and Coconut Research Institute
CDA	Coffee Development Agency
CGIAR	Consultative Group on International Agricultural Research
CGS	Competitive Grant Scheme
CIB	Coffee Industry Board
CIC	Coffee Industry Corporation
CIFOR	Center for International Forestry Research
CIMC	Consultative Implementation and Monitoring Council
CIP	International Potato Center
CRI	Coffee Research Institute
DAL	Department of Agriculture and Livestock
DASF	Department of Agriculture, Stock and Fishery
DFID	Department for International Development, UK
DNPM	Department for National Planning and Monitoring
DPI	Department of Primary Industry
DSIP	District Services Improvement Program
EOI	Expression of Interest
EU	European Union
FARA	Forum for Agricultural Research in Africa

FPDA	Fresh Produce Development Agency
FPDC	Fresh Produce Development Company Limited
GCARD	Global Conferences on Agricultural Research for Development
GDP	Gross Domestic Product
GFAR	Global Forum on Agricultural Research
GIS	Geographic Information System
GoPNG	Government of Papua New Guinea
HDI	Human Development Indicators
IAASTD	International Assessment of Agricultural Knowledge, Science and Technology for Development
IAR4D	Integrated Agricultural Research for Development
ICR	Implementation Completion Report
ICRA	International Centre for development-oriented Research in Agriculture
ICRISAT	International Crops Research Institute for the Semi Arid Tropics
IDPM	Integrated Disease and Pest Management
IFC	International Finance Corporation
IFOAM	International Federation of Organic Agriculture Movements
IFPRI	International Food Policy Research Institute
IMF	International Monetary Fund

IPA	Investment Promotion Authority
ISNAR	International Service for National Agricultural Research
ISP	Institutional Support Project
IWG	Institutional Working Group (ARDSF)
JICA	Japanese International Cooperation Agency
KARI	Kenyan Agricultural Research Institute
KIK	Kokonas Indastri Koporesen (Coconut Industry Corporation)
L&CB	Learning and Capacity Building
LINK	Learning INnovation Knowledge
LNA	Learning Needs Assessment
M&E	Monitoring and Evaluation
MC	Management Committee (ARDSF)
MDGs	Millennium Development Goals
MFVP	Marketing Fruit and Vegetable Project
MIS	Management Information System
MTDS	Mid Term Development Strategy
NADP	National Agricultural Development Plan
NAIF	National Agricultural Innovation Facility
NAQIA	National Agricultural Quarantine and Inspection Authority
NARI	National Agricultural Research Institute

NARS	National Agricultural Research System
NAIF	National Agriculture Innovation Facility
NCAIGS	National Competitive Agricultural Innovation Grant Scheme
NCC	NARS Coordinating Committee (ARDSF)
NDSP	National Development Strategic Plan
NEC	National Executive Council of PNG
NGO	Non-Governmental Organisation
NRI	National Research Institute
NSO	National Statistic Office
NWG	NARS Working Group (ARDSF)
NZAID	New Zealand Aid
NZIER	New Zealand Institute of Economic Research
OCAT	Organisational Capacity Assessment Tool
OPIC	Oil Palm Industry Corporation
OPRA	Oil Palm Research Association
OVI	Observable and Verifiable Indicator
OWG	Organisational Working Group
PGK	Papua New Guinea Kina
PLA	Participatory Learning and Action
PME	Planning, Monitoring and Evaluation

PNG	Papua New Guinea
PNGWiADF	Papua New Guinea Women in Agriculture Development Foundation
R&D	Research and Development
RAAKS	Rapid Appraisal of Agricultural Knowledge Systems
RFF	Resources for the Future
RIC	Rural Industries Council
RIU	Research Into Use programme
SC	Standing Committee (ARDSF)
SSA CP	Sub Saharan Africa Challenge Programme
SMDHT	Strategic Management and Development of Human Talents
SPTF	Strategic Planning Task Force
TAAP	Technical Appraisal and Advisory Panel
TAP	Technical Appraisal Panel
TORs	Terms of Reference
UK	United Kingdom
UNDP	United Nations Development Programme
UNITECH	University of Technology, PNG
UNRE	University of Natural Resources and Environment
UNU-MERIT	United Nations University-Maastricht Economic and Social Research Institute on Innovation and Technology

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Introduction

Adiel N. Mbabu¹ and Andy Hall²

THE ORIGINS AND AIMS OF THIS BOOK

This book contains a collection of papers that discuss the experience of an Agricultural Research for Development (AR4D) capacity building program in Papua New Guinea (PNG). The program was the AusAID-funded Agricultural Research and Development Support Facility (ARDSF), which ran for five years from 2007 to 2012, and which sought to improve the delivery of services by agricultural research organisations to smallholder farmers.

AR4D is an emerging mode of agricultural research practice in the international development community. Definitions of this practice are rather fluid, but its key intent is to directly link investments in research with tangible development outcomes. The way to actually do this is still a work in progress — a gap that this book seeks to fill. However, it seems quite clear that AR4D's use of systems perspectives on learning, innovation and change have fundamental implications for the way agricultural research is conducted and the way capacity is built.

Recognising the importance of learning how to follow an AR4D orientation, this book originated as an attempt to document the capacity building process that ARDSF undertook and to draw lessons from it. This desire to develop and share lessons was not part of the original ARDSF design. However, those

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involved in the program felt that their experience held valuable lessons for others. Lesson learning of this type in programs is increasingly viewed as a key way of improving the performance of agricultural and other development investments. Techniques such as institutional histories and other types of self-reflective exercises are now advocated as complementary activities to external review and evaluation approaches that most development investors require for both accountability and learning purposes.

While documenting process and developing lessons are laudable aims in theory, doing so in practice can be difficult, particularly in a busy development program with no mandate for either research or publications. ARDSF's approach to this grew organically as opportunities for documentation and analysis arose along the way. This has shaped the format of the book, which is neither a conventional academic book on AR4D, nor a traditional manual or resource book on how to use AR4D in capacity building programs. Rather, this book is a hybrid of the two. To understand this format and the aims of the book it is useful to share how the book emerged.

ARDSF was a challenging program, but all those involved in it recognised its intrinsic value — mainly because of its adoption of an AR4D orientation. Having realised that the ARDSF experience was richer than what was being captured by the program's M&E system, the ARDSF Director (one of the editors of this book) took it upon himself to find ways to document the process more comprehensively. Working with different people who had been involved with ARDSF, he began to record experiences. In doing so he recorded not only the rationale for why different approaches were followed, but also the different steps that were taken in the capacity building process, the pitfalls encountered and the outcomes achieved. These efforts produced the initial drafts of the chapters in Section 3 of this book.

Having completed most of the documentation process the ARDSF Director then brought in the second editor of this book to help distil critical reflections on ARDSF, particularly its use of AR4D as a way of framing its capacity building approach.

This entire process shaped the book in two ways. Firstly the chapters describing the capacity building process, presented in the third section of the book, took on more of a resource book flavour as each was prefaced by a recap of principles of the AR4D orientation as well as an account of different elements of ARDSF's capacity building process. Secondly, the different authors

bring in different styles and perspectives. The authors of the papers that form the chapters of this book were all involved in ARDSF in different capacities: Some as advisors and managers of ARDSF, some as participants in the capacity building process, some as consultants providing specific technical expertise and one as a program reviewer and scholar of agricultural innovation. As a result, each author brings a different perspective and emphasis and this is reflected in the nature of the chapters: some are more contextual, some are more descriptive, some are more concerned with process documentation and others focus more on critical analysis by attempting to draw out generic principles for global practice and theory. Our task as editors of this book has been to present these experiences in a logical sequence and to draw together an overall analysis that talks to the wider issues in policy and practice debates about the ongoing challenge of using agricultural research for development and impact.

In doing this we hope that the book fulfils its two aims: sharing lessons from a comprehensive capacity building process and adding to the international efforts to add flesh to the conceptual bones of the emerging ideas of AR4D. Our hope is that the book will provide resources to inspire others on the use of AR4D to reframe capacity building and make agricultural research a more effective tool in global development efforts.

WHAT MAKES ARDSF A VALUABLE CASE?

The objective of ARDSF was to improve the delivery of services from research organisations in PNG to smallholders³. This is not an unfamiliar objective in the development assistance world, although dealing with the entirety of a country's national agricultural research and extension system is ambitious even in a relatively small country such as PNG. However, instead of going the conventional route of a technical assistance program by providing training and formulating new plans and strategies, ARDSF was established as a flexible support facility that could respond to the changing capacity needs of research organisations in PNG. Instead of simply focusing on the capacity of individual research organisations, it also focused on building synergy between them and with public and private development organisations. ARDSF also piloted an innovation grants scheme and had an explicit agenda of linking research to policy-making.

³ In PNG agricultural research organisations have both a research and extension mandate.

Perhaps, most uniquely, ARDSF adopted an ambitious framework for its capacity building efforts: Agricultural Research for Development (AR4D). AR4D is a term that is used by a number of international and regional and sub-regional agricultural development organisations, particularly in Africa, to describe a style of agricultural research that is explicitly focused on achieving development outcomes. It consists of a set of principles for rethinking the way agricultural research delivers development outcomes. At the time of its adoption by ARDSF the conceptual foundations of AR4D were well-established (Mbabu and Ochieng, 2006; Daane, 2009). Organisations such as ICRA (International Centre for development-oriented Research in Agriculture), but also others, had spent many years promoting a more development-oriented style of agricultural research (see Hawkins et al., 2009 for examples of IAR4D experimentations). However, AR4D had never been used to guide a system-wide capacity building exercise of such an ambitious scope as that attempted in PNG.

Not surprisingly the history of ARDSF reveals a program beset with challenges and setbacks. It had to work hard to convince a range of stakeholders that its chosen implementation path was the right one. It had to find a way of changing the mind-set of a critical mass of planners and researchers, research managers and their partners so that a new way of organising research for development could be introduced. Equally, it had to be creative in finding ways to translate AR4D principles into practical planning, management and monitoring systems and funding arrangements. It also had to live up to the expectation that tangible improvements in service delivery to farmers would result from this — and it had to achieve this in a relatively modest time frame of only five years.

An AusAID Independent Completion Report (Hall and Gilbert, 2012) for the project concluded that ARDSF had achieved much of what it set out to do, drawing attention to three areas of capacity building achievements:

- a.** Capacity to identify and support smallholder-responsive production and livelihood opportunities: The Agricultural Innovation Grants Scheme.
- b.** Capacity in smallholder-responsive organisational planning: Implementation at the organisational and National Agricultural Research System levels.
- c.** Capacity in smallholder-responsive policy processes.

The report goes on to say: “the outcomes of ARDSF represent a significant achievement that should be celebrated as a success, particularly in light of the key lessons it holds for PNG stakeholders and agricultural development practice more generally.”

To understand the specific types of lessons that the book aims to deliver, it is useful to briefly look at current global debates on capacity building of agricultural research for development.

CHANGING VIEWS OF CAPACITY BUILDING OF AGRICULTURAL RESEARCH ORGANISATIONS

The value of agricultural research and technological change and innovation in transforming economies is uncontested. Yet the search for ways to improve the delivery of agricultural services to smallholders has exercised the minds of policy-makers for the entire 50 years of the development assistance era. This search remains as relevant as ever in countries such as PNG. Despite the emergence of new sources of economic growth, innovation in the agriculture sector remains a key avenue to poverty reduction, food security and a trigger for broad-based growth (World Bank, 2008).

The history of delivering agricultural services to smallholder farmers is one of approaches and capacities that worked well in one country but failed miserably when replicated in others. Alternatively, approaches and capacities may have worked at a certain point in time, but gradually become less effective as the agricultural sector landscape evolved. This was particularly true of agricultural extension. No amount of training, retraining and new incentives improved service delivery in several developing countries. Successive best practice models suffered a similar fate.

What started to change thinking on capacity building was the move to approach the challenge of better service delivery from a totally different direction.

Instead of taking service delivery mechanisms as the starting point, there is now a view that it is better to start by first asking what needs to be achieved. This is uncontested: the transformation of agricultural production and smallholder livelihoods as an essential component of economic growth and improved well-being. This then provides a target to work backwards from —

from the design of service delivery mechanisms, research approaches and policies that are fit-for-purpose in different circumstances.

This renewed interest in what needs to be achieved — usually called impact — has made innovation (a useful change of any sort) a valuable way of framing capacity building. It means that capacity building is not just focused on innovation inputs, such as research and service delivery. Instead it addresses the whole range of activities, investments and policies that make change happen, while focusing on improving the way these different elements work together for impact.

A useful and popular metaphor for this view of capacity is the idea of an innovation system, defined as all the actors and their interactions involved in the production and use of knowledge and the institutional and policy context that shapes the processes of interaction, knowledge sharing and learning (World Bank, 2006).

This way of visualising change implies that research and extension organisations may need to make use of partnerships with familiar and unfamiliar players if they are going to make a useful contribution to development. It also means that new policies and other factors that shape how things are done — for example, new institutional arrangements — are also types of innovation that can have impact in their own right. These policy and institutional innovations can be particularly powerful when combined with new technology.

A systems perspective of the sort embodied in innovation systems thinking does not deny the importance of scientific and allied skills. However, it does mean that the links between research and development outcomes imply that new skills and management systems are needed if agricultural research and extension organisations are to perform effectively as part of a dynamic, multi-agency development process. A central element of this new capacity building agenda concerns the ability to continuously respond to a changing environment. This means research and extension organisations need to become learning organisations, continuously revisiting their own performance and the way this is managed and activities are organised.

One of the ways capacity building for innovation has started to take shape is in the Agricultural Research for Development (AR4D) orientation — one that explicitly recognises the systems nature of the innovation process and makes the link between research and development outcomes explicit and mandatory.

HOW DOES THIS BOOK CONTRIBUTE TO THE CAPACITY BUILDING DEBATE AND PRACTICE?

The idea of AR4D has been enthusiastically embraced by the international agricultural community — it is now flagged as a mission/ strategy/ roadmap by a number of prominent regional and international research organisations, including the Global Forum on Agricultural Research (GFAR)⁴, the Forum for Agricultural Research in Africa (FARA)⁵, the Consultative Group on International Agricultural Research (CGIAR)⁶ and the Global Conferences on Agricultural Research for Development (GCARD)⁷. But what does this sort of approach entail in practice, and, specifically, in capacity building?

AR4D certainly presents some compelling principles that resonate with much of recent thinking on innovation systems and contemporary notions of capacity as a systemic phenomenon — these are explored in detail in chapter 2 of this book. These principles include the need for capacity building to be learning-based and participatory; to be results-driven and explicitly linking research to development; to take a systems view, where research is planned and executed as part of a wider development agenda; to involve partnerships with policy and practice stakeholders; and for it to be a continuous process of learning, where capacity building responds to the evolving context of the agricultural sector.

But these principles leave three unanswered questions in terms of practical application.

1. What type of support program can enable the type of learning-based systemic capacity building of the sort suggested by AR4D?
2. Can such a program promote the attitudinal change needed to create an enabling environment for AR4D?
3. Will such a program be sufficient to ensure the sustainability of the capacity building process put in place and the emergence of AR4D as a routine way of supporting agricultural innovation and development?

The final chapter in this book uses the experience of ARDSF to respond to

⁴ www.egfar.org

⁵ www.fara-africa.org

⁶ www.cgiar.org

⁷ <http://gcardblog.wordpress.com/>

these questions. Yet the book's contribution is not so much about listing and describing the contents of an AR4D tool box, nor is it a blueprint for capacity building interventions such as ARDSF.

The main message from this book is that achieving a more development-oriented agricultural research agenda is not something that can be achieved quickly, painlessly or by advocacy alone. Systems perspectives on innovation can help with the rethinking that is needed in planning and conducting research in more development-oriented ways and in building the capacities needed to support this new way of working.

However, without political and policy buy-in, institutional development in research practice may be unsustainable. A key challenge ahead is to find better ways to evidence the effectiveness of the way of doing research implied by AR4D and to use this evidence to get the necessary support from policy and other sector stakeholders.

The final chapter of this book takes these ideas and presents some reflections on how an AR4D orientation could be moved forward in more general application.

THE ORGANISATION OF THE BOOK

This book is divided into four sections: (I) Introduction (this chapter) (II) Context; (III) AR4D Capacity Building in Practice; and (IV) Outcomes and Lessons. The sections that follow the introduction contain the following chapters:

Section II: Context

This section provides the international, national and program context of the experiences described in the subsequent sections of the book. It has the following chapters:

Chapter 2. In Search of Agricultural Research for Development: A New Capacity Building Agenda?

This chapter explores recent international debates about approaches to capacity building of agricultural research. It provides a review of the conceptual underpinning of AR4D and recent advocacy for its wider use as a way of

framing some of the key questions that this book seeks to explore.

Chapter 3. The Evolution of the Agricultural Sector in PNG

This chapter presents a historical perspective on the development of agricultural services and sector policies in PNG. It explains why capacity building was required and why a strengthened role of agricultural research was critical to the development pathway being followed in the country.

Chapter 4. The Origins and Design of ARDSF

This chapter explains the way ARDSF followed on from previous AusAID support to agricultural research in PNG. It explains the way it was designed as a support facility and the way its different components were tailored to support a widely conceived vision of capacity. This included the creation of a well-coordinated national agricultural research system and the necessary organisational, funding and policy development, as anticipated, to achieve this.

Section III. AR4D Capacity Building in Practice

The aim of chapters in this section is to provide the reader with practical examples of different elements of the AR4D-framed capacity building orientation of ARDSF. Each chapter begins with a recap of the way AR4D reframes different elements of capacity building. The emphasis in the rest of each chapter is on illustrating the way these ideas were used, the challenges that this entailed and then draws lessons from these. The chapters in this section cover the following topics:

Chapter 5. Organisational Needs Assessment and the Design of an Implementation Strategy for ARDSF

This chapter describes the initial activities undertaken by ARDSF to develop an implementation strategy with its NARS partners.

Chapter 6. Facilitating Agricultural Research for Development in Selected PNG NARS Organisations

This chapter describes the main operational steps in the organisational development process. It presents a series of case histories of the way this process played out in different NARS organisations and it reflects on the value of the orientation adopted.

Chapter 7. Facilitating Agricultural Research for Development in the National Agricultural Research Institute (NARI)

This chapter takes a more detailed look at the organisational development process in NARI (the key food crops research institute in PNG). NARI had received considerable support from AusAID earlier. This chapter shows the way the ARDSF process added value to those earlier investments by supporting strategic planning and the management of human talents.

Chapter 8. Empowering the Human Side of the Organisation to lead the AR4D Approach

This chapter describes the way staff in research organisations were equipped with a range of new skills to help them function more effectively in their organisations once AR4D had been adopted as a way of framing capacity building. This was particularly important in the whole ARDSF process, as this was critical in bringing about the cultural change in these organisations that was necessary in allowing research to be orientated towards development outcomes. The chapter shows the way that recognising and developing human talents underpins the wider organisational and policy developments that ARDSF helped to bring about.

Chapter 9. Facilitating the Agricultural Innovation Grant Scheme in PNG

This chapter describes the development and implementation of a grant scheme to fund innovation projects. This was critical to the whole ARDSF process as it pioneered a new service delivery mechanism for agricultural services and provided funding for the NARS to work in collaboration with a wide set of development stakeholders. The success of the grant scheme laid the foundation for its scaling up as a national competitive grant scheme.

Chapter 10. Facilitating the Development of the ARDSF Theory of Change

This chapter describes the rationale and development of a monitoring and evaluation system for ARDSF. The use of cascading logic was critical in this process as this was a key tool in linking together project, program and organisational outcomes with higher order development goals. This cascading logic is explained in detail in the chapter. The chapter also reveals some of the challenges in getting such an M&E system to function effectively.

Chapter 11. Facilitating Research-Policy Linkages

This chapter describes the way ARDSF helped the PNG NARS develop links with policy-making. This was seen as a critical part of the capacity building process and has helped institutionalise a successor program in the form of

a proposed National Agricultural Innovation Facility with an accompanying national competitive grants scheme.

Section IV. Outcomes and Lessons

Chapter 12. An Unfinished Symphony? Achievements and Sustainability of ARDSF

This chapter presents a review of the main achievements of ARDSF. It is based largely on the findings of independent reviews of ARDSF.

Chapter 13: Lessons from ARDSF and Reflections on AR4D.

This chapter draws lessons from the experience of ARDSF to make more general reflections on AR4D.

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SECTION II: Context

In Search of Agricultural Research for Development: A New Capacity Building Agenda

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INTRODUCTION

A RDSF, with its focus on improving the delivery of agricultural research services, is part of a long tradition of development assistance projects tackling capacity building of agricultural research and extension organisations. One of its key features is its use of Agricultural Research for Development (AR4D) as a framework for structuring its support of capacity building. AR4D is a term that is used by a number of international, regional and sub-regional agricultural development organisations in Africa to describe a style of agricultural research that is explicitly focused on achieving development outcomes. AR4D is part of a long history of approaches, concepts, and capacity building frameworks aimed at improving the performance of agricultural research. Those advocating AR4D have assimilated many of the ideas that have emerged in this history and are now trying to develop what this might look like in practice. ARDSF is an example of this emergent practice.

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There is, however, a considerable degree of ambiguity concerning what AR4D actually is. On the one hand there are those that see this as a partnership or multistakeholder-based protocol for conducting research. Others see this as a farmer-centric, farming systems-type of approach similar to participatory research. And there are others, including ourselves, who see this as a fundamental shift towards a systems-oriented approach to learning, innovation and capacity development. This chapter explains how the explicit systems orientation of AR4D demands a different approach to capacity building. In this view the role of an external intervention such as ARDSF is to facilitate and build capacity for learning and change at both the organisational level and at the level of the wider institutional and policy landscape in which these organisations sit so as to improve their performance in achieving development goals. The aim of this chapter is to introduce this systems perspective on capacity building, explain the emergence of AR4D in international agricultural development practice and, therefore, provide a lens to explore the use of AR4D described in the subsequent chapters. The chapter identifies the key questions that this book seeks to answer about the ability of interventions such as ARDSF to introduce and sustain a development orientation in agricultural research practice.

THE INCREASING SYSTEMS ORIENTATION OF CAPACITY BUILDING IN AGRICULTURAL RESEARCH AND EXTENSION

Over the years capacity building in agricultural research and development has been framed in a number of different ways, with distinct phases (see box 2.1). Two key shifts in thinking have taken place over time. The first is a progressive shift from building the capacity of individual organisations (a bricks and mortar-type approach) towards a more systems-oriented capacity building perspective, where research is seen as just one part of a wider process of change and development. Second, accompanying this increasing systems orientation, there has been a shift from research and technology delivery capacity building to a capacity building focus on enabling innovation. Here innovation is understood to mean the new use of existing or new ideas or the new combinations of ideas that have social or economic significance.

These shifts have, in turn, been driven both by concerns about the weak performance of agricultural research and extension as a way of achieving development impact, but also by a recognition of the complexity and systemic nature of agriculture and change associated with it (see box 2.2). In other

BOX 2.1. FOUR PHASES OF CAPACITY BUILDING

Phase 1. National Agricultural Research Institutes. Creation of public research and extension expertise and infrastructure to supply improved and scientifically validated technologies to farmers.

Phase 2. National Agricultural Research (and Extension) Systems. Conceiving research as part of pluralistic technology delivery systems, comprising public and private organisations, NGOs and research as well as education organisations.

Phase 3. Agricultural Knowledge and Information Systems. Building on pluralistic technology delivery systems to create rural knowledge systems, as well as making use of knowledge and expertise of farmers and other rural agencies. This phase was mainly aimed at agricultural extension practice rather than research, although it had implications for the latter.

Phase 4. Agricultural Innovation Systems. A framework that recognises the range of research and non-research, public and private actors involved in the process of creating, adapting and putting into use information and technology for socially and economically useful purposes. This involves adaptive capacities for a continuous process of technical, institutional and policy learning and innovation.

Source: Rivera et al. (2006)

words, there is recognition that agriculture cannot be viewed in terms of a series of independent elements (crops, livestock, markets, livelihoods and policies) with isolatable problems that can be tackled by research alone. Instead, it is now widely believed that these are all interconnected elements of a dynamic whole, where stimulating change involves a set of related changes at different levels (technological, organisational, institutional and policy). A focus on innovation signals an interest in how to achieve outcomes in these complex systems rather than just looking at inputs such as research and technology.

REFRAMING CAPACITY BUILDING IN A SYSTEMS FRAMEWORK

A current trend in building capacity to support agricultural development is to use the heuristic of an agricultural innovation system (World Bank, 2006; 2012) (see box 2.3 on agricultural innovation systems). An agricultural innovation system is defined as “a network of organisations, enterprises and individuals focused on bringing new products, new processes, and new forms

BOX 2.2. DIMENSIONS OF COMPLEXITY IN AGRICULTURAL DEVELOPMENT

Production complexity: Many agricultural production challenges, rather than being isolatable problems that could be tackled independently, proved to be bundles of interrelated issues at the interface of agronomic practices, genetic improvement and pest management; at the interface of crop and livestock production; and at the interface of agricultural production and markets. Agricultural research organisations adjusted to this realisation by adopting farming systems research approaches in the 1970s and '80s and strengthening the multidisciplinary of research.

Social complexity: Rogers' (1962) notion of "lead" and "laggard" farmers and the associated need to increase delivery efforts to promote the diffusion of new technology soon proved to be misguided. Supply-driven systems could not respond to the technology needs of farmers. These needs were often quite heterogeneous, not only because of variable production environments, but also because of the demands and constraints of the livelihood systems in which farmers were operating. In addition institutional issues, such as the way input and output markets operated, were often more important than technological constraints. This was recognised to an extent in farming systems research. Farmer participatory research methods of the 1980s and 1990s attempted to address this more directly by engaging farmers in the research and technology development process. The logic behind this was that farmers had a better understanding of the complexity of their own production and livelihood environments. The Agricultural Knowledge and Information System (AKIS) approaches of the 1990s and early 2000s also recognised the role of farmers in the process of change.

Organisational complexity: Over the years the agricultural sector has become populated with a wider set of different players with different stakes. There were many reasons for this. Partially it was to do with the (re)emergence of the private sector in the structural adjustment and economic liberalisation process starting in the 1980s and 1990s. Partially it was also due to non-government organisations emerging to fill gaps left by ineffective or retreating public sector agricultural and rural development services. The reconceptualisation of capacity as National Agricultural Research Systems was one attempt to recognise the role of different players in the sector, although effective engagement with this wider set of players proved difficult.

Functional complexity. The increasing organisational complexity described above led the agricultural sector to be characterised by a set of competing, complementary and intersecting agendas — termed agricultural multifunctionality (IAASTD, 2009). It is no longer a sector with the unidimensional role of producing food or primary commodities for industry and export. It has critical social functions, particularly in countries with large rural populations dependent on agriculture and with few other employment or investment opportunities. It has a range of economic functions: as a source of

BOX 2.2. *Continued*

national economic growth, international competitiveness and a route to social and economic empowerment in rural areas. It is no longer just concerned with food production, but also as a source of sustainable energy, environmental services (carbon, water, biodiversity) and a way of tackling climate change. Through its role in nutrition, agriculture has close links with human health. In some countries the rural sector has important recreational roles. This multifunctionality characteristic has emerged as a major challenge for building agricultural research and extension capacities in the last 10 years.

Development ambitions complexity. In the early era of capacity building the overriding development ambition for research and extension was increasing food and agricultural production. Over the years this ambition was widened to include systemic, higher-order ambitions, particularly poverty reduction and environmental sustainability at national and global levels. While food and agricultural production have an important contribution to make to these higher order ambitions, these are, in fact, composite ambitions where a bundle of policy interventions — health, education, infrastructure, markets, energy — need to contribute collectively to achieving these goals. Once again this has challenged a capacity building approach premised on the idea of agricultural research and extension as a stand-alone, sectoral intervention.

Source: Authors

of organisation into social and economic use, together with the institutions and policies that affect their behaviour and performance” (World Bank, 2006).

As a framework for building capacity the idea of an agricultural innovation system embodies many principles that have been used both in business (see box 2.4 on organisational learning) and, more generally, development practice (see box 2.5 on learning-based approaches). These include:

- **Organisational and systems focus.** Organisations need to build a range of skills and competencies. However, since capacity is understood as a systems phenomenon, wider systems dimensions also need to be tackled. This includes building links between different organisations and promoting collective action. It also includes tackling the enabling environment of the system through policy and institutional change.
- **Hard and soft skills focus.** Organisations need to build hard skills and competencies that relate to their core business, such as research and research management skills. However, organisations also need

BOX 2.3. KEY INSIGHTS FROM AGRICULTURAL INNOVATION SYSTEMS THINKING

Focus on innovation. It shifts attention from research and other inputs to the change process and reframes analysis and capacity building in terms of outcomes; in other words changes or innovations that have social and economic consequences. This draws attention to the productive use of information rather than just its creation by research.

The importance of different types of innovation. Innovation is not just concerned with technical change. Instead it also includes process, organisational, institutional and policy innovations. Often these different types of innovation work together. For example, new ways of making research more client-oriented may lead to new types of technical innovation. Policies to support smallholder agriculture may provide the incentives for new types of value chains to emerge.

The importance of policies and institutions. Policy and institutional arrangements (how things are done and organised) are key in shaping the innovation process and are, therefore, a key component of capacity. For example, policy conditions can shape the particular development pathway that a country follows. By the same argument capacity building also involves ensuring that processes are in place to allow institutional and policy change to take place. In other words an effective innovation capacity is one that can generate the policy and institutional changes needed to enable other forms of innovation.

Responsive and dynamic. The framework stresses the continuous nature of the innovation process. This recognises that organisations are not operating in a static environment, but one which is continuously changing: market changes, technological changes, policy changes; environmental changes, etc. The ability to be responsive to these changing conditions requires continuous adaptation of the ways organisations work, adaptation of the networks they link into for information and support and adaptation of the policy environment. As a result capacity is not a static entity, but rather one that must be continuously reinvented and upgraded.

Source: Authors

to build soft skills such as the ability to work in partnership with other organisations and stakeholders or the ability to reflect on performance and share lessons about both failures and successes (see point below on learning and performance management). Negotiation skills are also important as change and innovation is often contested in collective endeavours.

- **Focus on institutional development.** Policy and institutional arrangements (how things are done and organised) are key in shaping the innovation process and are, therefore, a key component

BOX 2.4. ORGANISATIONAL LEARNING

Argyris and Schön's idea of organisational learning (1978; 1996) has been a major influence in the way organisations in the business world develop new strategies, reorganise themselves and improve their performance. The approach has a capacity building dimension because its focus on learning is a way for organisations to constantly upgrade the way they work.

In the business world these ideas have been a powerful aid because companies find themselves in a complex environment of just the sort that agricultural research and extension organisations find themselves in now — dynamic market conditions, rapidly changing patterns of competition, changing policy and regulatory environments, the need to form alliances with different players at different times, etc. In other words it is an environment where companies not only need to continuously innovate in terms of the products and services that they provide, but also in terms of the way they work to develop and deliver these. The parallels with the predicament of agricultural research and extension organisations are striking.

Source: Authors

of capacity. For example, policy conditions can shape the particular development pathway that a country follows. By the same argument capacity building also involves ensuring that processes are in place to allow institutional and policy change to take place. In other words an effective innovation capacity is one that can generate the policy and institutional changes needed to enable other forms of innovation.

- **Facilitation rather than training.** Since a systems perspective on capacity recognises this to be highly context-specific, capacity blueprints, such as organisational plans or strategies, are rarely effective. Instead, it is much more effective to facilitate organisations to explore their goals and performance and help them to develop their own effective ways of working.
- **Strong focus on learning and performance management.** A systems perspective on capacity building places great emphasis on learning and performance management. Partially this is because of the context-specific nature of capacity discussed above and the need for organisations to learn new ways of working that suit their particular circumstances and environment. It is also important because organisations (and policymakers) are often facing rapidly changing conditions and ways of working need to be constantly adapted to cope with these. This emphasis on learning means that

BOX 2.5. LEARNING-BASED CAPACITY BUILDING IN DEVELOPMENT PRACTICE

Over the last 20 years or so views of capacity building in development practice have also started to reflect this systemic, multidimensional perspective with a number of learning-based capacity development approaches emerging under different names: Social Learning (Leeuwis and Pyburn, 2002); Participatory Learning and Action (www.planotes.org); Rapid Appraisal of Agricultural Knowledge Systems or RAAKS (Engel, 1995; 1996), Adaptive Collaborative Management (Colfer, 2005), etc. These have been powerful in helping address individual and organisational capacities. However, despite the best of intentions, these are less effective in terms of tackling the wider system of policies and institutional arrangements that provide the enabling context for capacity (Ojha et al., 2012). Fukuda-Parr et al. (2002) warn of this problem, explaining that building up the capacities at the level of the individual and the organisation is necessary but not sufficient. The agency of the individual or organisation to apply its capacities depends on the capacities of society as a whole (Fukuda-Parr et al., 2002).

Source: Authors

monitoring and evaluation systems are a critical capacity building tool helping to continuously reflect on performance and improve ways of working

- **Capacity building as a dynamic, ongoing process.** In a systems perspective capacity building is not a one-off intervention, but a continuous process of upgrading and change. Relatedly, it reveals learning-by-doing, reflection and adaptation as key elements of capacity building, both at an organisational level as well as at the level of the system as a whole, as these are essential ways of coping with change and uncertainty (see above).
- **Need for organisations with an intermediary role.** The systems perspective on capacity building also points to the need for actors with a role in facilitating links between organisations and helping negotiate systems changes through policy dialogue. These types of entities are often referred to as innovation brokers and represent a key component of capacity.

Revisiting the conundrum of capacity building in development practice Fukuda-Parr et al. (2002) provide a useful summary of the challenges that a shift towards a system perspective entails.

“Rather than starting from a mail-order catalogue of standard parts to be forced into likely looking slots, the challenge instead should be to

fully understand the local situation and move forward from there step by step.”

THE EMERGING PRACTICE OF CAPACITY BUILDING OF AGRICULTURAL INNOVATION SYSTEMS

In the earlier agricultural research and capacity building perspective, with the main focus being on organisations producing and delivering technology, the unambiguous agenda was to ensure that expertise, infrastructure and resources were available to do this. In the systems perspective, where enabling innovation is the key task, capacity building options go well beyond a focus on agricultural research and extension organisations and involve strengthening the networks, interactions, and policy and institutional conditions from which innovation arises (World Bank, 2006).

This presents a wide range of new capacity building options and there is growing experience of putting these into practice. These include supporting the development of entrepreneurial activity as this is where innovation adds social and market value to ideas (Hall and Dorai, 2012); building value chains that connect farmers to new markets and stimulate innovation in response to consumer demand (Devaux et al., 2006); establishing innovation platforms to connect ideas with opportunities (CGIAR, 2010; Nederlof et al., 2011); establishing specialist innovation broker agencies to build links and partners and negotiate policy change (Klerkx et al., 2009; Kingiri and Hall, 2012); establishing sector coordinating bodies to build coherence across member organisations (World Bank, 2006); new modes of competitive funding for consortium development (Mudahar, 2012; Hall, et al., 2010); support of public-private sector partnerships (Hall, 2006); establishing decentralised design and manufacturing arrangements for agricultural machinery (Hall et al., 2007); funding existing innovation trajectories that hold the promise of success (Reddy et al., 2012); investments in participatory planning (scenario planning, and foresight exercises) that bring together different players in the innovation process (Hambly, Hall and Dorai, 2012); and a range of policy measures aimed at improving the environment for innovation (Roseboom, 2012) — seed price policy, Intellectual Property Rights, finance and tax trade regimes, etc.

These capacity building options recognise the importance of embedding agricultural research and extension organisations in the wider system of

innovation. However, this still leaves the question of how to retool these organisations so that they can play this more integrated and responsive role within innovation systems. Some have argued that the process of, for example, engaging in partnerships will allow research and extension organisations to build social capital with a range of potential partners over time and that slowly they will learn new ways of working with them (Hall, 2006). However, the experiences of introducing participatory research methods to restructure relations with farmers suggests that organisations do not necessarily automatically learn new ways of working (even when they prove valuable) and that existing institutional set-ups and cultures tend to hamper the spread of valuable institutional innovations (Hall and Nahdy, 1999; Prasad et al., 2005).

A more fundamental problem is that agricultural research organisations still need an adequate scope of research expertise (from basic to applied) to service the range of innovation processes they are integrated into, as well as long-term research agendas such as plant breeding (Lynam and Elliot, 2004; Lynam, 2012). To make the same point differently, the new-found policy interest in innovation, while reframing notions of capacity, does not allow us to side-step the need to support agricultural research and extension organisations. Rather it suggests that renewed efforts are required to strengthen and transform these organisations. As Horton (2012) succinctly explains, this means the introduction of new organisational and management systems not just for doing research, but for doing research for innovation.

This sentiment of doing agricultural research for a purpose is actually an idea that has been taking shape since the 1990s and has started to take shape recently in the idea of agricultural research for development (AR4D). There are a number of interpretations of this idea (which will be explored below). Despite this fluidity of interpretation, it has assimilated many of the systems perspectives discussed above and is emerging as a recognisable branch of agricultural research and extension capacity building and practice. We shall now explore the origins of this idea and the perspective it presents on capacity building.

THE ORIGINS OF AR4D AND ITS IMPLICATIONS FOR CAPACITY BUILDING

The origins of AR4D can probably be traced back to the late 1990s and the crisis that agricultural research was facing at that time. It was a time of declining

funding and research organisations were under increasing scrutiny to not just deliver research, but to demonstrate its impacts on poverty. It is not clear who first coined the term AR4D, but variations of this term started to gain currency in the early 2000s among a group of researchers and research management specialists and trainers working on African agricultural development. The sentiment was, however, clear and much of the language used to express this was common. A “business as usual” approach to agricultural research and extension was not going to help farmers with the huge challenges they were facing: stagnant or declining productivity; weakening commodity prices and a range of pest and disease problems that research had done little to address. The answer was to look for ways to reinvent agricultural research as an effective tool for development.

There were a number of strands of work that were driving this. Researchers in the Kenyan Agricultural Research Institute (KARI) started experimenting with new ways of combining planning, monitoring and evaluation (Mbabu and Mugah, 1998). The logic here was that research organisations would never achieve development impacts unless they systematically planned their activities in a way that individual projects complemented each others’ contribution to higher order development goals and viewed agricultural research as part of a portfolio of complementary development interventions. Coupling planning, monitoring and evaluation was seen as a way of both learning how well these plans were working as well as making research accountable to higher order objectives.

The work in KARI was carried out in collaboration with a long-standing capacity building partner, the International Service for National Agricultural Research Systems (ISNAR), part of the CGIAR. ISNAR was unique in the CGIAR system in that unlike all the other international centres it had an explicit capacity building agenda rather than research (although as will be related this eroded over time).

The institute was also unique in that it was staffed by an eclectic set of professionals: economists, sociologists, human resource specialists, organisational development specialists, research management specialists, evaluators and policy researchers. As a result of this it drew on professional perspectives outside of agricultural research. Many of these perspectives were already using systems ideas, particularly in the fields of evaluation, and organisational development. So, for example, ISNAR’s capacity development activities were already making use of learning and evaluation as

BOX 2.6. AGRICULTURAL RESEARCH FOR DEVELOPMENT (AR4D)

AR4D is premised on the idea that agricultural research can only become an effective policy instrument to address production and smallholder livelihoods when this is an explicit aim of the development pathway chosen by a country. AR4D provides a framework that helps in the necessary rethinking of agricultural research as an integrated element of the wider development process. It uses the conceptual and analytical principles of innovation systems as well as tools and principles from organisational learning and development and results-based management. It recognises four key elements of capacity building that need to be reviewed and strengthened in light of an impact agenda:

Scope of research: The range of research programs (e.g., production, postharvest, processing, marketing, policies, and organisations) and different types of research (basic, applied, and adaptive) needed to deliver results

Scale of research capacity: Organisation and management systems, including partnerships necessary financial resources and infrastructure needed to deliver results

Resourcing of research and allied activities: Novel mechanisms to support effective delivery systems.

Organisational learning: To build necessary competencies to deliver expected results. Involves problem identification, diagnosis, planning intervention, evaluation of outcomes and re-planning subsequent actions

Source: Mbabu and Ochieng (2006) and Lynam and Elliott (2004)

ways of upgrading organisational performance (see Horton et al., 2003). The organisation was also unique in that it was focusing on retooling professional skills of agricultural researchers and research managers to help them cope with the changing context of agricultural development. This led to the rolling development of a series of capacity development modules aimed at helping research staff learn their way into new roles and ways of working.

Another organisation that played an important role in the emergence of AR4D was the International Centre for development-oriented Agricultural Research (ICRA). Based in the Netherlands with a special focus on Africa, ICRA also had a specific capacity development role, with a mandate seeking to reskill agricultural research professionals. During the 1990s this agenda was articulated as “client orientated agricultural research” and was couched in terms similar to the farmer participatory research ideas in vogue at the time. Gradually over time this changed to a “research for development” perspective. Jon Daane (the then director of ICRA) explains that “this new paradigm requires enhancing the capacities of *all* actors in the innovation

process to collectively play their part, and not only those of the research organisations. These capacities include the ability to jointly learn from each other and benefit from the diverse competencies of the actors to find adequate solutions (negotiated compromises) that add value to and go beyond their individual contributions” (Daane, 2009).

WHAT IS AR4D?

A key event in developing the main tenets of AR4D was a 2003 book project — funded by the Rockefeller Foundation and led by the Kenyan Agricultural Research Institute (KARI) with partners from other research and development organisations — titled *Transformation of Agricultural Research Systems in Africa: Lessons from Kenya*. The idea behind the book was to document lessons learned from a decade of organisational capacity building in KARI. In the book Lynam and Elliot (2004), but also others, set out some of the main principles of what would become a recognisable articulation of AR4D. The discussion of the AR4D concept continued in a number of African agricultural research organisations and fora, notably the sub-regional organisation ASARECA (the Association for Strengthening Agricultural Research in Eastern and Central Africa) and later, using the term Integrated Agricultural Research for Development (IAR4D), in the Forum for Agricultural Research in Africa (FARA) (see Hawkins et al., 2009). While these different articulations of the AR4D approach drew from similar conceptual origins, many of these discussions remained a wish list of how organisations should operate. Box 2.6 presents one of a number of attempts to define AR4D and its principles.

A more concrete step in the direction of how AR4D might be operationalised came from Mbabu and Ochieng in 2006. As a background to the development of a research and capacity building program at ISNAR (by then merged with another CGIAR centre, IFPRI), they set out what was required to develop an AR4D system. Their opening argument was that Africa’s agricultural development goals would never be achieved without:

1. Carefully linking the research agenda with national development priorities
2. Increasing coordination, interaction, inter-linkages, partnerships, and networks among the various agents associated with African research for development systems, and
3. Securing innovative financing and resourcing mechanisms

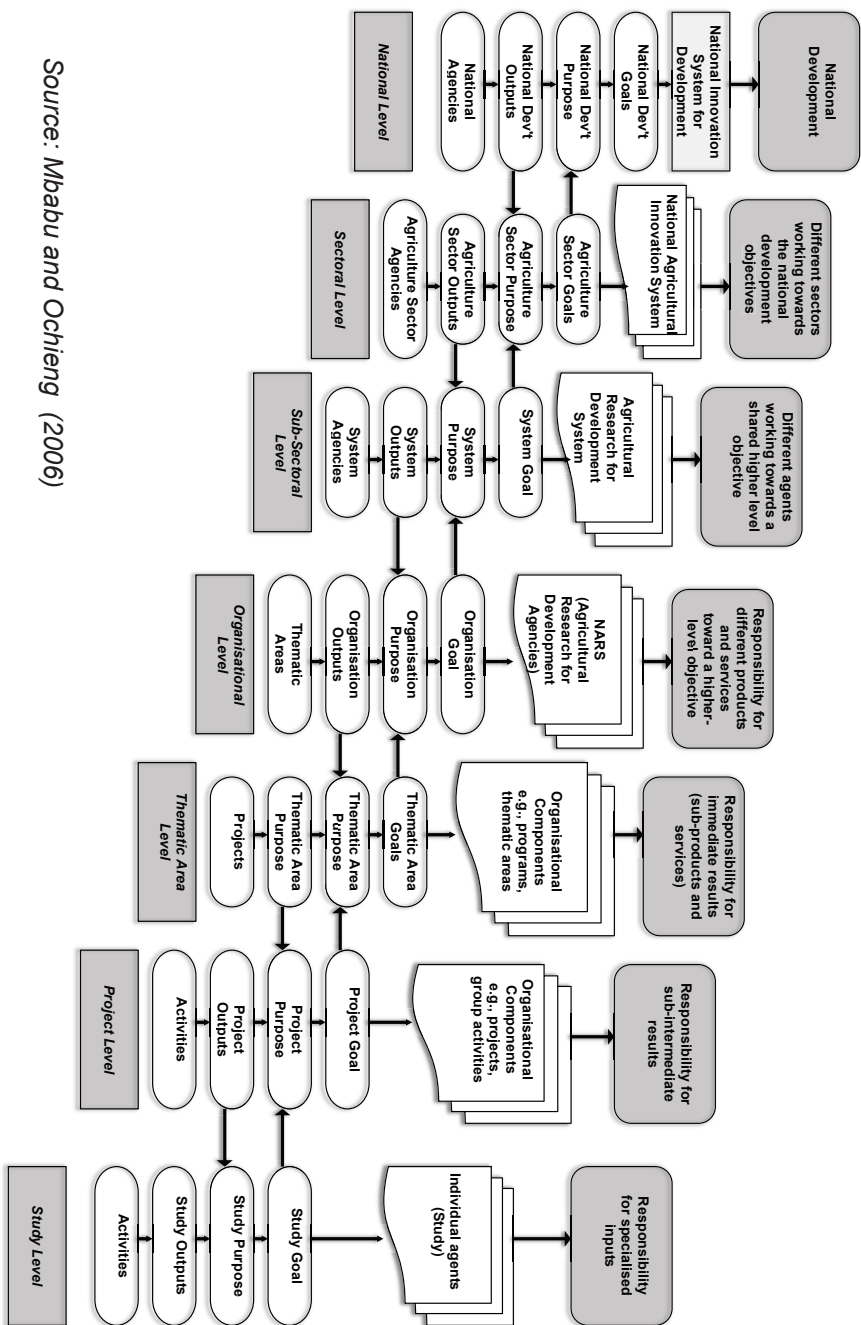
They did not present a blueprint for how this should be achieved, but explained the main capacity building challenges that needed to be addressed to make this a reality. Two familiar systems themes run through all their explanations of these challenges. The first is the idea that the national development plan of a country is made up of a number of constituent parts (including research and its sub-components), and that only if these parts are planned and executed in a coordinated systemic fashion will results be achieved. Their discussion of capacity building challenges hinges on the sorts of changes needed to plan and execute activities in this coordinated systematic way.

The second is that building capacities to operate in this sort of way requires a collaborative, participatory process, whereby organisations develop and execute plans through a process of learning with partners and other stakeholders. In other words, while capacity building for AR4D could borrow best practices from elsewhere or even from within respective organisations, the process will need to be based on solid “learning by doing,” preferably through action research to ensure systemic learning.

The key insight of Mbabu and Ochieng (2006), however, concerns the way they conceptualised the relationship between the scope of research (and its adequacy in terms of the broader development agenda) and the way this research is organised in terms of strategic plans (setting out goals and priorities) and program development (how different elements of the research agenda are organised). Their argument is that for research planning and implementation to make an effective contribution to development outcomes, they need to be undertaken from the perspective of making logical links between each component and desired development outcomes. They describe this as a cascading logic (see figure 2.1).

This is best described in their own words: “Cascading logic illustrates that, despite system diversities, it is possible to negotiate a virtual system held together by shared objectives. The system determines intended outcomes and invites diverse agents to develop a coherent division of labour, demonstrating how the various competencies can contribute. To manage innovation processes effectively to achieve grassroots impact, it is important to consolidate activities through a logical hierarchy of objectives — with associated responsibilities and accountability — whereby the goal of each activity is linked to the overall purpose of the host project. Similarly, project goals should feed into program goals, program goals into institutional goals, and institutional goals into system goals. Thus, cascading logic provides a simplified representation of a

FIGURE 2.1. CASCADING LOGIC



Source: Mbabu and Ochieng (2006)

highly complex network, forming a pyramid with the individual agents at the base and the AR4D system at the apex.”

The power of this cascading logic is that it provides a capacity building road map that allows each organisation — and each program within each organisation — to understand how its work contributes to development outcomes and highlights the other organisations it needs to work with to make this a reality. In other words it is a way of framing capacity building that makes the links between research and development outcomes explicit.

HOW CAN THIS BE TAKEN FORWARD IN PRACTICE?

Hawkins et al. (2009) undertook a comprehensive review of the theory and practice of AR4D (they used the term IAR4D) and concluded that examples of IAR4D good practice are still the exception, rather than widespread practice. They argue that more than implementing particular activities, IAR4D is a matter of creating and continually developing these capacities.

“Create the enabling environment and IAR4D activities may take place; try to implement the actions without first creating favourable conditions, and the results will be disappointing and/or unsustainable.”

They go on to argue that most research organisations have yet to come to terms with these capacity requirements and that this goes beyond any research method, approach or framework, and it requires individuals and organisations to reflect on whether they are prepared to make the necessary changes. As priorities they see the need for a range of attitudinal changes and refection by all stakeholders involved in the support and execution of agricultural research (see box 2.7)

In a review of organisational development experience in agricultural research organisations, Horton (2012) starts to unpick the practical realities of introducing a learning-based approach to capacity building of the type advocated by AR4D. He points out that transforming an agricultural research organisation into a learning organisation requires that bottom-up initiatives be complemented with strong leadership from the top to ensure that organisational learning takes place and that useful organisational innovations are mainstreamed. Leadership within the organisation is needed to formulate

BOX 2.7. ATTITUDINAL CHANGES AND REFLECTION NEEDED BY ALL STAKEHOLDERS INVOLVED IN THE SUPPORT AND EXECUTION OF AGRICULTURAL RESEARCH

Individuals need to reflect on whether they have the knowledge, skills and, above all, attitudes to work with others (of different disciplines, professions, educational levels, cultures) on a basis of mutual respect and trust.

International and national agricultural research organisations need to individually determine to what extent IAR4D should be incorporated within their mandates, or whether they should focus on more basic ('upstream') research for technology generation and leave IAR4D to others.

R&D organisations that do decide to engage in IAR4D need to examine what this means for their governance structures, management, resources (including staff disciplines and competencies), procedures (including assessment procedures), and overall 'culture' (openness, learning).

Donors to research and development organisations need to reflect on whether their financing frameworks, impact-assessment procedures and timeframes realistically reflect and encourage the (generally broad) outcomes and impact they wish to achieve.

All types of organisations involved in IAR4D need to examine whether they are prepared to dedicate the resources necessary to form and manage effective partnerships. They also need to acknowledge where and when they are prepared to take the lead in convening and facilitating multi-stakeholder innovation platforms.

Source: Hawkins et al. (2010)

appropriate goals and strategies, improve policies and management systems, and adjust organisational structures where appropriate.

Horton goes on to say that:

“For agricultural research organisations to shift their focus from doing research to using research to foster innovation, they are likely to need changes in the following areas: strategy formulation; accountability to end-users and beneficiaries; partnership policies; planning and evaluation systems; incentives; administration and finance; and organisational arrangements.”

TABLE 2.1. CAPACITY BUILDING ACTIVITIES

ORGANISATIONAL ELEMENT	PRIORITY FOR CHANGE
Capacity development and change management	Develop new competencies related to communication, facilitation, and mediation needed to work with diverse stakeholders in identifying and developing new opportunities for technical and institutional innovation
Strategy formulation	Shift from production of research outputs to fostering innovation processes that contribute to broad socioeconomic goals
Accountability and governance	Include representatives of diverse stakeholders, including smallholders, market agents, and consumers, in governance bodies
Partnership policies	Formulate policies for working with partners, including the objectives and types of partnerships and principles for decision making, communication, and sharing of costs and benefits
Planning and priority setting	Develop practical procedures for systematic planning and priority setting, which combines stakeholder inputs with analysis of costs and benefits
Monitoring and evaluation (M&E)	Develop learning-oriented M&E systems that clarify “impact pathways,” monitor progress in relation to these markets, and use results to improve the design and implementation of ongoing and future work
Incentives for change	Reward teamwork and partnerships that produce practical results. Develop competitive grant schemes for innovation projects
Administration and finance	Increase flexibility in arrangements to allow adaptive management and responsiveness to emerging needs and opportunities
Organisational arrangements	Develop mechanisms or units to manage inter-organisational partnerships with multiple lines of accountability
Beyond the agricultural research organisation	Develop specialised innovation brokerage units outside of the national agricultural research organisation

Source: Horton (2012)

This wider suite of capacity building activities is illustrated in table 2.1.

A more fundamental critique of attempts to use innovation systems-inspired approaches, including AR4D, is the tendency to use specific elements rather than tackling capacity building in a systemic way.

For example, a review of the reform of African agricultural research organisations by Chema et al. (2003) concludes that most research organisations are grappling with elements of AR4D, but not treating it systemically. Worse still, they were not systematically managing a paradigm shift, which would have given them the impetus to build capacity in a holistic a manner (*ibid*).

Sulaiman et al. (2011) and Hall (2011) reach similar conclusions in their analysis of a systems-inspired program to help put agricultural research into use — the DFID-funded Research Into Use program (RIU). They bemoan the fact that rarely do so-called systems approaches deal with a system in its entirety; instead, such approaches shy away from tackling culture, institutional settings and policies that form the basis of the paradigm that shapes the way capacity building and innovation take places.

Hall (2011) rather ominously points out the dangers of not taking a systemic approach seriously:

“There are dangers involved in cherry picking from the innovation systems approach. RIU experiences suggest that there has been a “technology transfer” of elements of an innovation systems intervention and this has greatly undermined its potential for impact. Ideas such as partnership, entrepreneurship and innovation support services have been parachuted in without recognising that research-into-use interventions need to involve both technical and institutional innovation and that institutional and policy adaptation are required at all levels. This has meant that there is also an underlying flawed assumption that high-level institutional and policy learning will take care of itself. This lack of attention to the wider institutional change agenda severely restricts the potential of RIU-type interventions for impact.”

This reveals the central challenge of adopting AR4D as a way of framing capacity building: How can it be used systemically across the whole, research, innovation and development process, including the mindsets and policies that shape this process?

KNOWLEDGE AND PRACTICE GAPS IN AR4D

It seems that the state-of-the-art on AR4D and organisational development approaches for agricultural research has provided a strong set of principles for a new direction in capacity building: It needs to be learning-based and participatory; it needs to be results-driven and explicitly link research to development; it needs to take a systems view, whereby research is planned and executed as part of wider development agenda and involves partnerships with policy and practice stakeholders; and it needs to be a conscientious process whereby capacity building responds to the evolving context of the agricultural sector.

But these principles leave three major unanswered questions for practice and interventions seeking to building capacity.

- What type of support program can enable this type of learning-based systemic capacity building?
- Can such a program promote the attitudinal change needed to create an enabling environment for AR4D?
- Will such a program be sufficient to ensure the sustainability of the capacity building process put in place and the emergence of AR4D as a routine way of supporting agricultural innovation and development?

This is where the experience of ARDSF discussed in this book can help. The remainder of this book is dedicated to documenting the approach to capacity building adopted by ARDSF in Papua New Guinea and critically analysing its achievements in creating sustainable capacity in AR4D.

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The Evolution of the Agricultural Sector in PNG

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This chapter sets the scene for the discussion of ARDSF and its activities, which follows later in this book, by providing an overview of the challenges and opportunities that the agricultural sector in PNG faces today. It describes recent trends in agricultural production and prices and the implications these have on livelihoods. The chapter also provides an overview of policy and institutional development in the sector and the way this has shaped agricultural services — specifically research and extension.

AGRICULTURE IN PNG: CONTEXT

Papua New Guinea (PNG) is a diverse country with a population of nearly seven million people from more than 800 indigenous ethnic tribes and communities with distinct languages and cultures. This cultural diversity reflects its geography and diverse agro-ecological settings. The country's land mass of over 460,000 square kilometres is characterised by rugged interior mountainous ranges with well inhabited fertile highland valleys and plateaus

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of up to 2,800m and peaks reaching over 4,000m, to isolated valleys and river systems feeding into major rivers, wetlands and deltas along vast coastal plains and coastlines, and archipelagos, volcanic islands and coral atolls — all of which provide distinct cultural backdrops for PNG's people (Bourke and Vlassak, 2004). The enormity of the challenges faced by the country's traditional agricultural communities is thus best appreciated by understanding its diversity.

PNG is largely an agrarian society, with more than 80% of its population dependent on agriculture for a living. While the country is richly endowed with mineral and petroleum resources, the highly capital-intensive nature of extractive resource development could lead to economic enclaves and the risk of excluding the vast majority of the population in rural communities.

The World Development Report 2008 (World Bank, 2008) asserts that agriculture contributes to development as an economic activity, as a livelihood and as a provider of environmental services, making the sector a unique instrument for development. In the PNG context, land holds deep spiritual significance, providing food and nutrition, medicinal products and building material, besides being a source of valuable income.

This multifaceted nature of agriculture in PNG is often obscured by the fact that the sector contributes to less than a third of the gross domestic product (GDP). In fact, the agricultural sector's contribution to GDP has declined in nominal terms in the past 25 years from 33% in 1985 to 16% in 2010 (Temu, 2011). The situation is further compounded by the fact that the apparent overdependence on subsistence agriculture leaves a majority of the population "trapped" in a culture of poverty and deprivation. Thus, if PNG is to achieve the objectives of its Vision 2050 and the Millennium Development Goals, it is quite clear that the starting point has to be the transformation of the agricultural sector, upon which the majority of the population depends.

The poor performance of the agricultural sector in developing countries has often been attributed to "continued under- and mis-investment by most governments and international donors" (de Janvry, 2010).

In PNG, despite a series of institutional reforms and policy initiatives over 35 years (since independence in 1975), the agricultural sector has yet to achieve its full potential of contributing to the economic and social well-being of PNG's citizens.

The rest of this chapter examines the nature of these reforms and presents the case for a different approach to develop PNG's agriculture.

EVOLUTION OF THE PNG NATIONAL AGRICULTURAL RESEARCH SYSTEM

The evolution of public sector agricultural research and extension arrangements in PNG is defined by three phases since independence: the mid-1970s and early '80s reflected the political aspirations of a newly independent nation state; the mid-1980s and the '90s saw consolidation with some structural adjustments consistent with advice from the World Bank and the International Monetary Fund (World Bank, 1981); and the late 1990s to 2000s saw continued reforms with greater self-reflection on lessons learned. These institutional and policy reforms resulted in: a) the decentralisation of the central government and services to provincial governments; b) corporatisation of state institutions and; c) commodity market deregulation.

Reforms under Decentralisation of Government and Services to Provinces

The new country of PNG inherited the pre-independence era Department of Agriculture, Stock and Fishery (DASF) in September 1975. The DASF had an extensive nationwide presence with strategically located research stations. These research stations supported and were connected to a well-developed extension system with district-level rural development officers and technicians to complement research and provide extension services to provinces. Agricultural research was largely based around commodities and scientific disciplines and, therefore, resourced accordingly in terms of annual budget allocations and personnel competencies. Much of the research was done on-site in these stations within respective agro-ecological zones.

At the time the DASF pursued a dual policy of supporting large-scale private agricultural estate development, alongside an emerging sub-sector of smallholder producers transforming from subsistence to semi-subsistence and small-scale agricultural enterprises. This was a legacy of colonial policies that resulted in the early development of coconut and cocoa plantations in coastal provinces and coffee in the highland provinces. The DASF carried on this policy by developing large cattle ranches across the country as nuclei for smallholder cattle farmers, followed by the development of the oil palm sector along the same lines of large-scale nucleus estate plantations with smallholder

blocks for settlers and village oil palm block-holders.

The 1979 Organic Law on Provincial Governments brought with it efforts to decentralise government and ostensibly bring government services closer to the people. As a consequence, agricultural extension services were removed from the DASF to become exclusive functions of the newly established provincial governments. Further reforms in the early 1980s split up the DASF, with the functions of Forestry and Fishery under new departments and the remaining functions housed under the Department of Primary Industry (DPI). The DPI was renamed the Department of Agriculture and Livestock (DAL), as it is known to this day, in the late 1980s.

Reforms under Corporatisation and Market Deregulation of State Functions

Reforms continued over the years with the corporatisation of state-owned business enterprises and market deregulation, and re-organisation of public research functions. These changes in policy and institutional arrangements were driven by the need to improve efficiency, governance and resourcing arrangements, with the idea being to move funding, administration and management responsibilities from government bureaucratic systems to respective rural export industries and commodity boards. These boards were largely responsible for meeting their own research needs. This change of direction was also prompted by the findings and recommendations of a World Bank mission (World Bank, 1981) and a team from ISNAR (International Service for National Agricultural Research), which found that there was no single division specifically mandated with the planning and directing of agricultural R&D within the DPI (ISNAR, 1982). The ISNAR report also stated that the experimental stations established to carry out R&D ‘lacked focus in terms of their capacity to correlate their work with national priorities of development, and different disciplinary groups at the headquarters’ (Jain, 1987). According to Omuru (2003), “these problems were exacerbated by a lack of institutional and professional capacity to adequately address research requirements and a lack of complementary public policy”. Given these findings, the government decided to create new agricultural R&D agencies and entities through different types of legislative and institutional arrangements.

One such entity, the Oil Palm Research Association (OPRA), was established in 1981 and soon set the pace for industry taking responsibility for research. In this case the key oil palm industry stakeholders (estate and milling companies, smallholder farmers and government) registered an association

with the responsibility to conduct disciplinary research focused on oil palm agronomy, soils, pests and diseases. Research on oil palm breeding and quality seed production was retained as a self-funding business venture by the parent estate company. The Coffee Research Institute (CRI), which was set up in 1986, and the Cocoa & Coconut Research Institute (CCRI), established in 1986, were incorporated through the Investment Promotion Authority (IPA) Companies Act. The Fresh Produce Development Agency (FPDA) was established as a private company in 1988 under the IPA Companies Act, with line government departments (DAL, Department of National Planning and Monitoring (DNPM) and Treasury) subscribing as shareholders.

The remaining technical services and research functions were eventually devolved from DAL with the creation of the National Agricultural Research Institute (NARI) in 1996 and the National Agricultural Quarantine and Inspection Authority (NAQIA) in 1997 as autonomous statutory bodies under Acts of Parliament. The Oil Palm Industry Corporation was also established by an Act of Parliament in 1992 to take over smallholder oil palm extension services from the DAL. The regulatory, research and extension functions for the other tree crops have also come under reform since. The Coffee Development Agency (CDA) was set up to complement research by CRI, but all functions (including regulatory) are now aggregated in one body, called the Coffee Industry Corporation (CIC). The Cocoa and Coconut Extension Agency (CCEA) was similarly established in 1996 but has now amalgamated with CCRI to form the PNG Cocoa Coconut Institute (CCI). The latter is a shareholder company between its two parent boards, the Cocoa Board and the Kokonas Industri Koporesen (KIK). The two boards look after the regulatory functions of the cocoa and coconut industries, respectively.

Such extensive re-organisation involved an institutional shift in the way agricultural R&D had been administered and managed in PNG, from what has been commonly described as a ‘ministry of agriculture model’ to a ‘semi-autonomous institute model’, where research responsibilities lie within an administratively independent organisation (Trigo, 1987). However, the PNG Government still has representation on the commodity boards and research committees. Government participation was deemed necessary to ensure adequate account was taken of national priorities (ISNAR, 1982).

Resourcing Implications of Sector Reforms

Once the semi-autonomous export tree crops research institutes were set up

in the 1980s, each commodity sub-sector became responsible for financing its own research. Funds for research and extension are currently raised largely through variable export levies on each commodity, taking into account prices paid to farmers. Negotiations over these levies are done on a regular basis among service agencies, commodity boards, growers, industry and government, although entities such as NARI, NAQIA and FPDA depend more on government budgetary appropriations.

For the most part, however, agricultural research and development agencies in PNG depend on international and domestic development grants and soft loans for their funding needs.

The most recent institutional reform in the agricultural sector is aimed at improving the funding and coordination mechanism for national agriculture as a whole (Agricultural Development Strategy, 2000). This has given birth to the National Agricultural Development Plan (NADP 2007-2016), finalised in 2006, which integrates all past reforms through a comprehensive resourcing mechanism. The NADP attracts funding of PGK100 million annually (approx. US\$ 48 million) for the agriculture sector. However, controversial allocations of funds in the first 2-3 years of implementation resulted in calls for rethinking of the funding mechanism, especially in its governance and transparency in project selection. Currently, NADP funds are appropriated to districts under the District Services Improvement Program (DSIP). This arrangement calls for adjustments in how agricultural service providers partner and work with districts to invest in agriculture for development.

Overall, over the 35 years of reforms, the organisations in the agricultural sector have remained fragmented without any effective coordination mechanism, under-resourced despite the National Agricultural Development Plan (NADP), and with limited impact, especially for smallholder agricultural producers when it comes to improving their productivity and incomes.

THE PERFORMANCE OF PNG'S AGRICULTURE SECTOR POST-REFORM

The reforms in agriculture appear to have scarce influence over the performance of PNG's agriculture sector, given statistics indicating declining contribution to gross domestic product (GDP) and no significant improvement in human development indicators (HDI).

TABLE 3.1. AGRICULTURAL CONTRIBUTION TO GDP IN REAL TERMS: 1996-2012

Year	Value Added to Agriculture (K'000)*			National GDP (b)	% Share of Agri-cultural GDP	Relative growth of Agricul-tural GDP
	Marketed	Non-mar-keted	Total (a)			
1996	1,350.6	1,156.2	2,506.8	7,959.5	31.5	100.0
1997	1,364.5	878.1	2,242.6	7,454.6	30.1	89.5
1998	1,276.6	1,129.6	2,406.2	7,803.6	30.8	96.0
1999	1,418.1	1,253.7	2,671.8	7,948.4	33.6	106.6
2000	1,437.5	1,285.6	2,723.1	7,753.3	35.1	108.6
2001	1,352.7	1,263.1	2,615.8	7,749.7	33.8	104.3
2002	1,258.4	1,391.7	2,650.1	7,905.5	33.5	105.7
2003	1,424.5	1,425.9	2,850.4	8,252.3	34.5	113.7
2004	1,424.6	1,432.7	2,857.3	8,299.1	34.4	114.0
2005	1,510.5	1,510.2	3,020.7	8,625.2	35.0	120.5
2006	1,497.2	1,545.0	3,042.2	8,823.0	34.5	121.4
2007	1,717.9	1,567.5	3,285.4	9,637.4	34.1	131.1
2008	1,873.1	1,554.7	3,427.8	10,361.9	33.1	136.7
2009	1,835.9	1,614.9	3,450.8	10,861.4	31.8	137.7
2010	1,863.8	1,699.7	3,563.5	11,604.4	30.7	142.2
2011	2,127.6	1,726.0	3,853.7	12,931.3	29.8	153.7
2012*	2,132.0	1,730.9	3,862.9	14,269.6	27.1	154.1

Source: Department of Treasury, BPNG, compiled by Rural Statistics, DAL

Notes

1. * Indicates that it is still a forecast, while data from 2007-2011 are estimates from the Department of Treasury.
2. The non-market component is assumed to grow by the population growth rate of 2.3 percent annually. It is also a sizeable component of agriculture, with almost 85% of the population contributing to the growth in this.
3. The relative size of the economy expanded since 2008, much bigger than the expansion in agriculture.
4. Based on the average agricultural growth from 1996-2006, the market share is 52% and non-market share is 48% in reference to GDP 2007-2015.
5. Figures from 1996-2006 are from the National Statistical Office (NSO).
6. Figures from 2007- 2012 are from Annual National Budgets. Agriculture is broken up using BPNG shares of non-market and market.
7. Based on the most recent conversion rates available, 1PNG Kina (K) = US \$0.4840.

Agricultural Contribution to Gross Domestic Product

As table 3.1 indicates, the contribution of agriculture to the gross domestic product (GDP) has continued to decline over the years. This is partly explained by declining productivity and overall production levels; fluctuating commodity prices in the world market; and the dominance of extractive industries such as minerals, oil and gas in PNG. There has been modest growth in Agricultural GDP since 1996 onwards. However, given that inflation averaged over and above 10% p.a. during the same period, this translates to negligible growth in agricultural GDP in real terms.

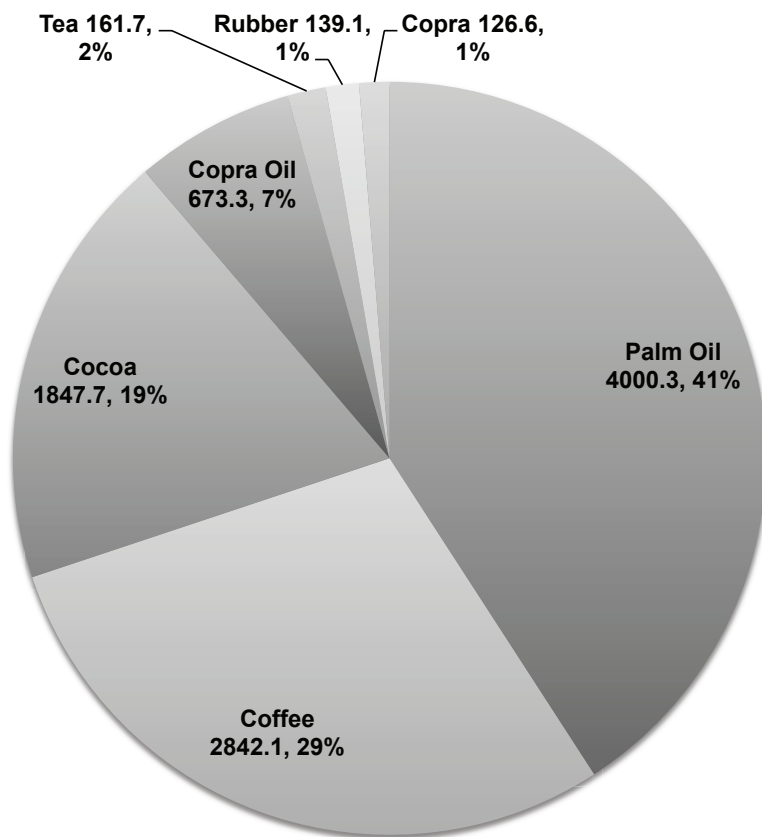
The period that followed major reforms in corporatisation — on the back of earlier decentralisation of extension services (1996-2010) — was characterised by stagnant production and productivity. Clearly, the reforms that targeted export commodity crops did not impact on the sector as intended (NZIER, 2006).

Agricultural commodity performance

The major export commodities in PNG are Oil Palm, Coffee, Cocoa and Coconut. Figure 3.1 shows their relative value in PNG agriculture. These sub-sectors have been the focus of major institutional reform over the years.

- (a) **Oil palm** is the leading agricultural export crop, currently generating over K1 billion (US \$ 484 million) per annum, and contributes 40% of agricultural export earnings in PNG. The sub-sector consists of smallholder farmers and large-scale plantations. According to the 2000 national population census, 19,877 households cultivated oil palm in PNG. Although the smallholder sub-sector covers nearly half of the area under oil palm (47%), it only accounts for a third of the actual production (OPRA Annual Reports cited in ARDSF Oil Palm Sub-sector Study, April 2010). This lag is largely explained by the relatively low inputs used by smallholder producers.
- (b) **Coffee** comes second to oil palm in export earnings in PNG, earning an average of K400 million (US \$ 193.6 million) per year (29% of total agricultural export earnings). Smallholder growers produce 85% of the coffee crop and the balance is produced by plantations and block holders. The industry provides formal employment for around 15,000-20,000 people either on a full time or part time basis. According to the

FIGURE 3.1. EXPORT REVENUE BY MAJOR TREE CROPS (K'MILLION), 2001-2008



Source: www.bankpng.gov.pg

(Cited in ARDSF's Review of Cocoa and Coconut Sub-Sectors Report. April 2010.)

2000 national population census, 397,722 households cultivated coffee and, therefore, the sub-sector has great potential for income generation. Some of the constraints facing the sub-sector include aging coffee trees, high debt levels, deteriorating rural infrastructure, law and order problems, land disputes, shortage of labour, pests and diseases, etc.

(c) **Cocoa** is the third highest earner of the export crops, averaging K227

million (US \$109.9 million) per annum (19% of total export revenue from agriculture). Around 151,000 households are engaged in cocoa production. With the decline of large plantations since the 1980s due to land tenure problems, the sub-sector is now dominated by smallholder producers, who are responsible for more than 75 per cent of national cocoa output. However, a reliance on low input production has meant that productivity levels for smallholders are substantially lower than for plantations. Recent pest attacks by the cocoa pod borer have been particularly devastating in low input production systems. On the other hand, PNG cocoa enjoys a price advantage in the global market by focusing on fine or flavour niche markets. A study of 100 cocoa growers in East New Britain Province indicated that the average annual income from cocoa was K2,867 (US \$ 1,387.6) per smallholder household (Omuru et al., 2001).

- (d) **Coconut** is ranked fourth in export earnings, but it is important to note that the commodity is also a significant food source in PNG. Around 309,417 households were reported to be engaged in coconut cultivation in PNG (NSO, 2001) at the time of the last census. This represents about 31% of total households in PNG. Farm families generate 80% of the copra produced in PNG.

Low adoption of modern farming practices by smallholder farmers has been identified as a core problem in both the cocoa and coconut industries. Constraining factors include: lack of an effective extension system, labour shortages, low levels of block maintenance, land shortages, poor infrastructure, and inaccessible rural finance. Consequently, both cocoa and coconut suffered low productivity levels.

- (e) Most planning documents in PNG focus on export crops, with little attention to the **fresh produce** grown and consumed locally in semi-subsistence and semi-commercial agriculture. It is estimated that 80% of villagers in PNG derive their incomes from selling fresh food — a higher proportion than any other cash earning activity. According to the 1996 Household Survey, about 80% of food energy consumed is from fresh locally grown staple foods (Gibson, 2000). The 1996 Household Survey estimated that total cash income earned from sale of locally produced fresh food was almost K60 million (US \$29 million) per annum. This was second only to Arabica Coffee at K97 million (US \$46.9 million) per annum.

TABLE 3.2. SELECTED HUMAN DEVELOPMENT INDICATORS FOR PNG AND OTHER PACIFIC ISLAND COUNTRIES

Country	Life Expectancy (years)			Child Mortality (per 1000 births)		
	1980	2000	2010	1980	2000	2010
Papua New Guinea	51	57	62	108	95	60
Vanuatu	65	68	70	110	44	14
Solomon Islands	60	69	68	56	25	22
Fiji	64	69	69	42	22	17
Samoa	63	69	72	98	26	19
Tonga	69	71	72	27	21	15
World	63	66	70	118	83	57

Source: World Bank Data

Human Development Index

The under-performance of agriculture has translated to inadequate living conditions of the majority of PNG's population. A glance at Human Development Index (HDI) indicators gives us an idea of the performance of the agriculture sector and its impact on people's well-being. PNG doubled its GDP between the mid-1990s and mid-2000s. However, as Table 3.2 tells us, there was little impact on the country's HDI in the same period. Between 1980 and 2010 HDI for PNG rose by a modest 1.3% annually from 0.295 to 0.431, ranking the country at number 137 out of 169 countries with comparable data. The same period saw the HDI of East Asia and the Pacific as a region increase from 0.391 to 0.650, placing Papua New Guinea below the regional average (UNDP, 2011).

The situation looks just as bleak when PNG is compared with other Pacific Island Countries that are less endowed in natural resource-base, but fare better on basic HDI figures.

This situation raises concern over the nature and extent of the institutional reforms in the country's agricultural sector that were carried out to improve service delivery and, ultimately, quality of life of PNG's people.

AGRICULTURAL R&D PERFORMANCE IN PNG

The institutional reforms may have created autonomous research and extension organisations in PNG, but their influence on agricultural productivity and individual well-being has been limited at best. Agricultural R&D in PNG has a history dating back more than 80 years, but has been criticised for lacking strategic focus (Omuru, 2003). For many years, there has been an obvious disconnect between research and policy-making in the PNG agricultural sector. In other words, agricultural policies have been designed in isolation and have not been informed by sound research and analysis. This has resulted in development agenda and targets that are usually very difficult to achieve.

As discussed earlier, PNG agriculture traditionally has had a dual character, with large-scale commercial plantations co-existing with village-based smallholder subsistent and semi-commercial operations. The commercial sub-sector is predominantly based around cash crops, while the smallholder sub-sector revolves around both cash and food crops. The latter sustains the bulk of PNG's population despite its low productivity levels. The situation has been changing over the years, however, with the number of foreign-owned plantations dwindling and the growth of smallholder agriculture in export crops.

Agricultural research and development now needs to recognise and appreciate the need to better service the smallholder sub-sector as part of a broad-based development strategy. If agricultural R&D and policy interventions are better targeted, then the sector is expected to make a significant contribution to the economy through major cash crops as oil palm, cocoa, coconut, coffee, and fresh produce. However, for this to happen the sector must recognise its shortcomings in supporting smallholders and embrace new and more responsive institutional arrangements for the NARS and its agencies to make more meaningful and sustainable contributions.

AGRICULTURAL INNOVATION CAPACITY IN PNG AND ITS CHALLENGES

The picture that emerges from the preceding discussion is of a national agricultural research system that is fragmented and has so far been unable to ably support smallholder agriculture in PNG, thereby improving livelihoods and providing food security.

PNG's commodity-based organisations were created to support the plantation sector, but now find themselves serving the smallholder sector. These organisations perform research, extension and, in some cases, regulatory functions. Some operate as public corporations, while others are non-profit companies that serve as the technical arm of commodity associations. There are also generic research organisations that cover a number of different commodities and are supported by public funds. These organisations have a history of working independently and have had weak links to policy-making.

PNG has no public national agricultural extension service; extension services are attached to specific research organisations and even these were established to promote technology transfer rather than supporting innovation more generally. However, there are large numbers of NGOs who play an extension-like role in support of certain developmental objectives, such as supporting smallholder livelihood. The last few years has also seen some mining organisations launching activities that support rural development.

This fragmented research and extension system was the backdrop to ARDSF's emergence in 2007 — a situation that presented the facility with great opportunities, but also immense challenges. The country had strong scientific capability in areas related to the major commodities. Many of the commodity-based research organisations had governance structures that were well linked to a wide range of sector stakeholders in both the development and commercial sphere, and ARDSF did well to link in to existing networks.

Among the challenges facing the sector is a strong reliance on disparate donor funding, which has brought with it conflicting messages and approaches. The research and extension organisations also work independently of each other and have a limited tradition of working with non-traditional partners. Links with policy-makers are tenuous at best, and sector policies have failed to target smallholder agriculture. These are the challenges that need to be addressed if agriculture's contribution to GDP and human development in PNG are to be realised.

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The Origins and Design of ARDSF

Adiel N. Mbabu¹ and Tesfaye Beshah²

INTRODUCTION

This chapter provides a description of the origins and design of the Agricultural Research and Development Support Facility (ARDSF), with an overview of its management and governance structures. It also describes the main operational components of ARDSF. The purpose of the chapter is to familiarise readers with ARDSF. This provides orientation for the process documentation chapters that follow in Section 3 of this book.

FACILITY ORIGIN AND CONCEPT

ARDSF was a successor to a previous Australian support program to the PNG agricultural sector — called the Australian Contribution to a National Agricultural Research System (ACNARS).

ACNARS helped strengthen the capacity of the National Agricultural Research Institute (NARI) to deliver services to smallholder farmers, while also supporting links between the research system and those farmers. ACNARS launched the Agricultural Innovations Grants Fund (AIGF) to support development activities arising from research and intended at showing

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direct benefits to smallholder farmers through the promotion of improved productivity, efficiency and sustainability of smallholder agriculture. From the outset, ARDSF benefited from the close, long-standing partnership between AusAID and PNG's agricultural research organisations, developed through ACNARS, AIGF and through the activities of the Australian Centre for International Agricultural Research (ACIAR).

In 2004 AusAID and the government of PNG agreed that future AusAID assistance would focus on the agriculture sector — specifically policy reform targeting governance and improved agricultural productivity through targeted assistance to research, development and extension. An AusAID PNG Agriculture Sector Research and Extension Program Planning Study in 2004 further developed the proposed program of targeted assistance and identified five priority areas for possible AusAID support. Two of these areas were selected for further study. These included a program of assistance to agricultural research and development, involving further assistance to NARI to develop its sustainable management and strategic capacity to deliver its mandate following on from ACNARS, together with a wider program of support to other agencies involved in the NARS. The wider program would be aimed at building institutional capacity, improving linkages and increasing collaboration between the NARS organisations in meeting the real needs of smallholder farmers, together with the development of a competitive grants mechanism for agricultural development targeting rural smallholders. This new phase proposed a continued focus on support for agricultural research, development and extension, but was now widened to include a broader range of actors in the NARS.

The term NARS is now used to encompass those agencies that operate through legislative mandate and have a central role in delivering agricultural research and development (R&D) services. During its time, ARDSF worked with six of the NARS organisations — NARI and five of the 10 commodity organisations (see box 4.1 for a brief description of the NARS associated with ARDSF).

ARDSF was launched on the back of studies carried out to analyse the state of PNG agriculture and define the areas where AusAID support was most required. An early study confirmed that the primary direct services from the PNG government to agriculture included: the provision of policy, research, development, extension and regulation. Further analysis articulated the confused, overlapping, disunited and inefficient state of sector governance

BOX 4.1. THE PNG NARS ORGANISATIONS

NARI. The National Agricultural Research Institute was established in 1996 with a mandate to conduct research on any branch of agricultural science, including cultural and socioeconomic studies. It has been heavily dependent on funding from AusAID, which helped establish it.

CIC. Coffee Industry Corporation (CIC) Limited is a public sector company formed in 1991 through the amalgamation of the Coffee Industry Board (CIB), the Coffee Research Institute (CRI) and the Coffee Development Agency (CDA). It is incorporated under the Companies Act with responsibility over industry regulation, research and extension as set out in its Constitution. It is largely funded by the Coffee Industry Board, but also receives support from the government and donors.

FPDA. The Fresh Produce Development Agency (FPDA) is a public corporation responsible for the development of the horticulture and fresh produce industry from production to marketing. Its mandate includes: disseminating information on fruit and vegetable production, identifying constraints to industry growth, assisting with technical information, providing advice on improving the fruit and vegetable industry and helping PNG achieve self-sufficiency in production and processing. It has been heavily dependent on donor funding, but also receives support from the PNG government.

OPIC. The Oil Palm Industry Corporation (OPIC) was set up through the OPIC Act of 1992 as a public sector corporation. It is mandated to provide extension services in production and productivity to smallholder oil palm growers. Under the current arrangement the OPIC Board reports to the Minister for Agriculture and Livestock. It is funded by the oil palm industry, the PNG government and donors.

OPRA. The Oil Palm Research Association (OPRA) is a not-for-profit private sector research association established in 1980 to provide research services to the country's then newly developed oil palm industry. The association has both public and private sector members. It is funded through member contributions, through market cess and donors.

CCI. The Cocoa and Coconut Institute is a public research and extension organisation that undertakes cocoa and coconut research and development for the Cocoa Board and KIK (the coconut industry corporation association of PNG). It is funded through market cess, by the PNG government and donors.

Source: Authors

arising from the multiple agencies delivering government services to this sector in PNG. This highlighted the need for interventions with agricultural R&D agencies to address governance reform concurrently with improving service delivery. Overlapping this analysis was the serious impact that the HIV/AIDS epidemic and gender inequality were having on PNG's development and the clear need to mainstream these issues into any new intervention.

ARDSF developed from the two priority areas and evolved into three distinct initiatives: ongoing support to NARI, broader support to the NARS, and a competitive national scheme to support R&D for the benefit of smallholder farmers. To link these three initiatives together, a facility was required as the overarching delivery mechanism.

FACILITY DESCRIPTION

The overarching goal of ARDSF was to increase opportunities for rural smallholders in Papua New Guinea to generate income and maintain food security. The facility's development purpose was to enable selected national agricultural research and development organisations to deliver improved services to their rural stakeholders. The purpose was to be achieved through:

- a)** Capacity development in the two areas of institutional governance and service delivery
- b)** Access to additional resources through a competitive grants scheme for service delivery activities

The outcomes sought from ARDSF were:

- PNG agricultural research and development organisations operate as an integrated and sustainable National Agricultural Research System that serves smallholder farmer needs in the areas of food security and commercial or semi-commercial agricultural development
- NARS organisations initiate and implement improvements in management and operational effectiveness
- Increased availability of innovative information and technologies for smallholder farmers
- The Agricultural Innovation Grants Scheme (AIGS) evolves as a potential framework for a national agricultural grants scheme in Papua New Guinea
- Gender and HIV issues are mainstreamed by NARS organisations

ARDSF Components

ARDSF was implemented in an integrated manner across the three facility Components:

Component 1: Institutional Development of NARI

Objective: Institutional development that enables NARI to better achieve its mission.

Component 1 recognises NARI's strength as an organisation and its capacity to best identify and address its own capacity development needs, with support and guidance from an agricultural research and development specialist and rigorous performance monitoring. A Letter of Understanding between NARI and AusAID formed the basis of the partnership between the two entities and engagement with ARDSF. NARI planned and implemented activities under Component 1 in consultation with the agricultural research and development specialist, drawing in part on the funds provided under the component. NARI also applied for institutional development funds through collaboration with the other NARS under Component 2, and improved resources for service delivery under Component 3.

Expected Outcomes:

1. Improved financial and institutional sustainability for NARI
2. Improved institutional governance of NARI
3. Improved service delivery to all stakeholders and improved responsiveness to farmer needs
4. Improved linkages with the other NARS organisations as well as broader sector stakeholders, including sub-national government and non-government agencies
5. Improved monitoring of organisational performance leading to continual improvement

Component 2: Institutional Development of the National Agricultural Research System (NARS)

Objective: Institutional development and improved networking of selected NARS to enable them to better achieve their respective missions.

Component 2 addressed the organisational, governance and capacity issues confronting the NARS, which impeded effective delivery of services to farmers. The five organisations included under this component work under different statutes across the public and private sectors and have different

service mandates. In developing activities, ARDSF recognised that issues confronting each organisation varied in type and scale across organisational functions, core business and institutional capacity.

Expected Outcomes:

1. More efficient and effective operation of the concerned NARS agencies
2. Improved delivery of services to NARS' primary stakeholders, including farmers and associated agricultural producers, agro-processors, marketing agents and consumer groups
3. More coordinated and unified support from the NARS to PNG's agriculture sector at strategic and operational levels
4. Gender and HIV mainstreamed in the core business of the PNG NARS

Component 3: The Agricultural Innovation Grants Scheme (AIGS)

Objective: Support the dissemination of agricultural innovations to rural smallholders.

Component 3 established the Agricultural Innovation Grant Scheme (AIGS), building on the pilot AIGF that was instituted under ACNARS. AIGS was designed as a small grants scheme, focused on dissemination and smallholder impact and promoting creative local solutions to the problems and constraints of smallholder farmers.

Expected Outcomes:

1. Increased opportunities for smallholder farmers to improve productivity and market competitiveness
2. Establishing a national grants scheme for PNG agriculture development
3. Improved performance of agricultural research and extension organisations, including both government and non-government agencies
4. Gender and HIV mainstreamed through AIGS activities

Facility Management

ARDSF was implemented by GRM International Pty Ltd. as the Australian Managing Contractor in consultation with representatives from GoPNG and AusAID. As the managing contractor GRM had ultimate responsibility for

the identification and recruitment of technical expertise to staff the facility, as well as activity and financial reporting to AusAID. The PNG executing agency was the Department of National Planning and Monitoring (DNPM). The NARS organisations were the implementing agencies.

Four separate, but related, committees comprised the overarching management structure of ARDSF. The Standing Committee (SC) consisted of representatives of AusAID, the DNPM and the Department of Agriculture and Livestock (DAL). The SC provided high-level assessment of facility outcomes and approval of the annual budget and individual component allocations.

The Management Committee (MC) was the key ARDSF management body, reporting to the SC and had decision-making and approval power over the whole facility, subject to SC approval. The MC consisted of heads of the NARS organisations or their delegates, representatives from AusAID, DNPM, civil society and industry. The MC had oversight over operational details of ARDSF, including reporting and performance assessment; funding allocations within and between ARDSF components; continuous improvement and promotion of learning between and within components.

The NARS Coordinating Committee (NCC) was composed of the heads of the NARS and the AusAID-appointed agricultural research and development specialist. It had oversight over the implementation of Component 2. It prioritised and endorsed the annual NARS workplans, identified synergies across activities and ensured collaboration between the NARS organisations. It met to consider progress on coordination between the NARS and to get updates on ARDSF's continued support of the NARS organisations. The NCC reported to the MC, particularly on the proposed ARDSF programs of work and specific recommendations.

The AIGS Selection and Scoping Committee (ASSC) oversaw all aspects relating to implementation of Component 3. It appraised proposals and selected successful proposals for funding. It determined the overall scope of the AIGS and the focus of application rounds. It reported to the SC, while keeping the MC informed on issues relating to the operation of the AIGS.

ARDSF Staffing

The facility management structure supported the implementation of the three components, with each having its own specific objective and outcomes. The

management also tried to maximise the integration of and linkages between the components as complementary units, while still contributing to the overarching ARDSF goal and purpose. Each component was managed as a notionally separate unit in order to deliver and measure the outcomes of each component. Cross-cutting technical support and management processes ensured complementarity and mutual support towards achieving ARDSF's goals.

AusAID appointed an agricultural research and developmental specialist to provide overall strategy development guidance for ARDSF. The specialist led ARDSF's engagement with NARI under Component 1 — a role that also involved supporting and advising NARI on its institutional development and helping the institute meet its partnership obligations with AusAID. He also supported NARI in monitoring its progress towards sustainability and improved service delivery. The rest of the ARDSF management team supported him in monitoring and evaluating NARI's engagement with Component 1, facilitated NARI's collaboration with the other NARS and supported its involvement with Components 2 and 3. The agricultural research and developmental specialist also: worked across Components 2 and 3 and facilitated institutional governance and service delivery improvements; undertook institutional capacity and training needs assessments of the NARS; and promoted linkages and networks between the NARS organisations and broader sector stakeholders.

The ARDSF coordinator was responsible for managing Component 2 and for developing a prioritised list of activities to address the capacity development needs of the NARS, both individually and collectively, and, in doing so, develop annual NARS workplans. The activities were developed with the ARDSF team, including the agricultural research and development specialist, following a comprehensive capacity and needs assessment.

The AIGS coordinator was responsible for managing Component 3 and for establishing and implementing the grants scheme. The AIGS coordinator prepared operating procedures for the scheme and managed all aspects of AIGS grant development and implementation. He was supported by AIGS project officers and administration and financial officers.

The ARDSF facility director (later designated as facility manager) was responsible for the overall management of the facility, the performance of the ARDSF team and the quality of all outputs and reports, together with

establishing and having oversight over all management procedures to ensure the effective implementation of ARDSF. Working closely with the AusAID-appointed agricultural research and development specialist, the facility director led the strategic implementation of the facility, integrating all three components, ensuring mainstreaming of gender and HIV/AIDS and a robust and relevant monitoring and evaluation system. Technical support within the team included institutional development, gender, HIV/AIDS and M&E, working across the facility as technical resources for the ARDSF management team and the NARS.

SECTION III: AR4D Capacity Building in Practice

Organisational Needs Assessment and the Design of an Implementation Strategy for ARDSF

Adiel N. Mbabu¹ and Miok K. Komolong²

INTRODUCTION

This chapter discusses the inception phase of ARDSF. ARDSF's design had set a broad purpose of improving service delivery by research and extension organisations to smallholders. Its design as a facility rather than a program gave it great flexibility in how this could be achieved. However, the design also did specify that ARDSF should be responsive to the capacity building needs of the NARS organisations. This chapter describes the different steps in the inception phase and the way these led to the development of an implementation strategy. These steps included a reconnaissance survey to identify the key features of the NARS organisations and the challenges they faced. This highlighted the need to equip the NARS with a vision of their role and contribution to the wider development process. An AR4D orientation was identified as an appropriate framework for rethinking the NARS' strategies and arrangements and was used to help them explore their own capacity needs through a needs assessment process. On the basis of this ARDSF developed

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a five-year plan, including detailed plans for its first year of operation. This inception process took approximately one year.

RECAP: CAPACITY NEEDS ASSESSMENT IN AR4D

ARDSF's inception phase began with an open mind over the sort of framework needed to guide the NARS organisations in the identification of their capacity building needs. However, during this phase AR4D was identified as an appropriate framework for guiding the capacity needs assessment process and, indeed, the implementation of ARDSF more generally. At this stage it is useful to recap the way AR4D is used in the needs assessment process, particularly the way it reframes the idea of capacity.

AR4D is not a normative perspective prescribing how capacities should be built. Rather, it acts as a guide to how agricultural research can be more effectively organised and conducted to serve smallholder agriculture. The analytical perspective of AR4D draws attention to: responsiveness of processes to smallholder clients and other sector stakeholders; linkages between research organisations and with farmers, development partners, the public and private sectors, and with policy-makers; learning and accountability to smallholder development; and the types of organisational, institutional and policy arrangements needed for research to work in these sorts of ways.

This perspective, therefore, gives AR4D a different view of capacity. It views this not only as the research and managerial skills of research organisations, but also as the ability to use these skills in ways that allow agricultural research to deliver to smallholders. AR4D does not prescribe, for example, partnerships with the public sector or farmer participatory research or multi-disciplinary research.

Instead, it provides the diagnostic principles that may draw attention to the need to work in different ways in order to achieve goals of farm level impact. It also draws attention to the policy environment, recognising that this must be supportive of the broad goals of a smallholder-led development paradigm.

Organisational capacity needs assessment in AR4D is, therefore, about exploring whether existing organisational, institutional and policy arrangements are enabling the sorts of ways of doing agricultural research that allow it to achieve its aims of servicing the needs of smallholders.

In ARDSF this sort of needs assessment was critical in providing a wider vision of the role of research and extension organisations in the development process. In doing so, it revealed all the different activities and processes and structures that needed to be in place to allow research and development organisations to contribute effectively to innovation that supports smallholders. This, in turn, helped define the sort of capacity building support that would be given to the NARS organisations.

GETTING STARTED: VISION OF THE INCEPTION PHASE

ARDSF's design (see chapter 4) as a facility rather than as a program meant that its underlying ethos was of a flexible, responsive and demand-driven mechanism for helping agricultural research and extension organisations (here after referred to as the NARS organisations) build their capacity to deliver services to smallholder farmers. The inception phase of ARDSF was, therefore, primarily concerned with initiating a process of engagement with the NARS organisations, and then working with them in a needs assessment process to define the broad contours of capacity building support. The inception phase was critical as this was the opportunity to develop a shared vision of what the capacity building support was working towards and what the architecture and competencies of this new capacity would involve.

At the outset it was recognised that each NARS organisation would be at a different stage of organisational development and would require different types of support at different points in time. This meant that it was important to both understand these differences, but at the same time develop a generic vision or pathway of capacity development that the different organisations could move along at their own pace. To initiate the needs assessment process, ARDSF undertook a reconnaissance survey to identify key issues that the overall capacity building framework would need to address.

RECONNAISSANCE SURVEY OF THE NARS ORGANISATIONS

The reconnaissance survey of the NARS was designed as a rapid, unstructured diagnostic exercise to determine the broad contours of capacity gaps in and among the NARS organisations. ARDSF's agricultural research and development specialist conducted the survey. The specialist's role in ARDSF was to advise on the design of the capacity building process (see discussion of

this role in chapter 4). The following key questions guided the reconnaissance and engagement process:

- What were each NARS organisation's mandates?
- What were the key results expected of each organisation?
- How were the institutes organised and resourced to deliver the results?
- To what extent were these results being achieved and how were these assessed and reported?

As part of the reconnaissance survey, the agricultural research and developmental specialist attended planning meetings with the NARS' senior management and reviewed available planning documents, such as strategic plans, where these were available.

The next section introduces the organisations that were covered by this survey and provides a diagnostic overview of the capacity challenges they were facing at the time. It is important to stress that these gaps were identified through a process of engagement and discussion with each organisation and were not developed extractively as a critical comment of their capacities.

DIAGNOSTIC OVERVIEW OF THE NARS ORGANISATIONS

National Agricultural Research Institute (NARI)

The National Agricultural Research Institute was established in 1996 with a mandate to conduct research on any branch of agricultural science, including cultural and socio-economic studies. Its purpose was stated as enhancing productivity and sustainability of the smallholder agricultural sector; and its goal was given as improved welfare of the smallholder agricultural sector. Since its establishment NARI has received support from AusAID to create the necessary infrastructure and human resources to lay the foundations of a viable R&D institute. The institute is located in Lae in the central highlands region of the country. ARDSF support to NARI was built on this long-standing relationship with AusAID. Under ARDSF this relationship was articulated through a Letter of Understanding³ providing, among other things, five-year budgetary support. This built on a previous corporate strategic plan that NARI

³ NARI funding Agreement 41712, May, 2007.

developed to better align its research to development outcomes.

Following several consultations with the NARI senior management and a review of major planning documents, it was apparent that there was a disconnect between the strategic objectives articulated in the corporate strategic plan (enhanced productivity and improved rural welfare) and lower level operations (research programs and projects). The strategic plan clearly committed the institute to deliver long-term development objectives. The medium-term research programs were, however, too vaguely defined to systematically deliver expected results; and the short-term research projects were a disconnected set of activities without the synergy and sequencing needed to achieve medium and long-term development objectives.

This pointed to the need for a results framework that would guide the development of organisational competencies, organisational structure and management systems, resourcing strategies and an organisational learning process. The survey also noted that although NARI had a national mandate, its centres were organised to deliver localised results through regional programs, without an organisational level framework to upscale successful pilots, experiences and learning to achieve national impact.

Coffee Industry Corporation (CIC)

The Papua New Guinea (PNG) Coffee Industry Corporation (CIC) Limited is a public sector company. It was formed in 1991 through the amalgamation of the Coffee Industry Board (CIB), the Coffee Research Institute (CRI) and the Coffee Development Agency (CDA). CIC Ltd. was incorporated under the Companies Act and conferred with powers of industry regulation, research and extension as set out in its constitution. Its regulatory powers and functions were conferred by Parliament under the Coffee Industry Corporation (*Statutory Functions & Powers*) Act 1991. CIC's headquarters are located in Goroka. Research on Arabica coffee began in the late 1930s at its highlands agricultural experimental station in Aiyura and in the lowlands agricultural experimental stations in Kerevat, East New Britain, and the East Sepik Province.

At the time of the initial engagement with CIC, there was considerable tension between the corporation's management and its board over the issue of appointment procedures for the CEO. This highlighted the need to address CIC's governance system.

CIC operated both research and extension programs and performed regulatory functions for the coffee industry in PNG. The CIC extension model was in the process of changing from a one-on-one approach to a group-based approach at the start of ARDSF. However, what was unclear was the extent to which the group approach would make use of complementary resources and extension expertise in other public, private, and non-governmental and community based service providers. It was also unclear if the new extension approach would be responsive to smallholder farmers or even if they could adequately articulate their individual and collective needs.

CIC remained committed to multi-disciplinary and multi-organisational approaches, however. Examples of multi-organisational collaboration noted by the survey included joint ventures with NARI in tissue culture work; and collaborative work with ACIAR. However, it was unclear if the nature of CIC's research agenda had changed significantly as a result of adopting multi-disciplinary approaches. It was noted that there had been a reduction in staffing within the CIC research and extension division, although this situation could be mitigated by effective collaboration with other organisations. However, even this would still require CIC to maintain a critical mass of staff to form the basis for meaningful collaboration with other organisations.

Fresh Produce Development Agency (FPDA)

The Fresh Produce Development Agency (FPDA) is a public corporation responsible for the development of the PNG horticulture and fresh produce industry, from production to marketing. It originated from the Marketing Fruit and Vegetable Project (MFVP), which were set up in 1986 to collate and disseminate market-related and technical information on fruit and vegetables. The MFVP evolved into the Fresh Produce Development Company Limited (FPDC) and registered under the Companies Act in 1988 as a public corporation. FPDC's mandate was to focus on information dissemination on fruit and vegetable production, identify constraints to industry growth, assist with technical information, provide advice on improving the fruit and vegetable industry and help PNG achieve self-sufficiency in production and processing. Although FPDC changed its name to FPDA in 2005, it retained its status as a public corporation. FPDA's headquarters are located in Goroka. It collaborates closely with NARI in Aiyura, Port Moresby, Mt. Hagen, Lae and Rabaul.

At the time of ARDSF's initial contact with FPDA, it had been receiving

capacity building support from New Zealand Aid (NZAID) within the framework of an Institutional Support Project (ISP). Following consultations, the FPDA senior management, the ISP and ARDSF agreed on a joint needs assessment to help develop a shared understanding of the way forward.

At the time the FPDA corporate plan emphasised marketing of fresh produce. However, the strategy highlighted a long list of potential areas of investments that would need further refinement and prioritisation. These included: training needs analysis and planning; institutionalisation of management systems, including human resources, financial management, administration and logistics, and asset procurement and disposal; strengthening and improving the operation of the board, including carrying out a review of FPDA's constitution, developing operating guidelines and setting up a board secretariat; developing and strengthening vertical and horizontal communication channels within the organisation; strengthening existing gender and youth programs; developing gross margins of key crops in the highlands; carrying out feasibility studies to assess the potential for opening up new production areas to serve the burgeoning markets in urban areas; expanding market research and information functions; and ensuring functional monitoring and evaluation systems.

While there was justification for developing another strategic plan to clarify these and related issues, it was considered necessary to simultaneously identify a few priority activities for immediate engagement with FPDA. The logic here was that this approach would be building on the strength of past planning, while leaving room to address pending strategic organisational issues. It was agreed that ARDSF would lead the needs assessment process.

Oil Palm Industry Corporation (OPIC)

The PNG Oil Palm Industry Corporation (OPIC) was established through the OPIC Act of 1992 with the following functions:

- To promote and encourage increase in productivity in the oil palm industry by the more efficient provision of extension services to small-holders
- To promote the development of the oil palm industry, and in particular:
 - Implementation of improved husbandry technologies to increase production by small-holders;
 - Introduction of techniques for effective control and regulation

of oil palm pests and diseases by small-holders

- Development of representative grower groups among small-holders
- To promote the use of improved management techniques for cultivation and harvesting and improved quality control techniques among small-holders
- To collect, compile and circulate information, statistics and data relating to growers, crops and land among small-holders;
- To provide advice, disseminate information and educate small-holders on oil palm production methods
- To consult, liaise and collaborate with the state and other agencies and authorities concerned with or involved in the palm oil industry as well as growers and organisations interested or involved in the oil palm industry

The OPIC Act 1992 is the only legislative framework targeted at providing extension services in production and productivity to smallholder oil palm growers. Under the current arrangement the OPIC board reports to the Minister of Agriculture and Livestock. The OPIC general secretary heads the secretariat based in Port Moresby. OPIC operates in five project areas: Hoskins, Bialla, Kavieng, Popondetta and Alotau.

The Oil Palm Research Association

OPRA is responsible for providing research, development and technical support for the country's oil palm industry. It was formed in 1980 to provide research services to Papua New Guinea's then relatively new and expanding oil palm industry. OPRA is an incorporated 'not-for-profit' research association, with a roster of members that includes OPIC. OPIC, through its membership, represents the smallholder oil palm growers of PNG.

OPRA's research program is structured to meet the needs of the oil palm industry as a whole. Its Scientific Advisory Committee, on which all members are represented, reviews and establishes research priorities. To maintain OPRA as a responsive and efficient research organisation, the association addresses only the most significant constraints and threats to the sustainable production of palm oil.

The oil palm industry in PNG is set to at least double in size over the next 10 years (OPRA, 2007). This significant increase in growth brings with it new

challenges in research, extension, business and management. In 2008, OPRA participated in a strategic planning program to position the organisation to better serve its clients and stakeholders. It is also expected that its new strategic plan will consolidate existing relationships OPRA has with its key stakeholders as well as establish relationships with new partners with common and mutual interests.

OPRA is financed by a levy paid by all oil palm growers and also by external grants. In 2008 the organisation's budgetary spending was as follows: 52.2% for agronomy research; 16.3% for entomology research, 9.2% for plant pathology research, and 22.3% for management and centralised overheads. Based on this funding distribution, it is obvious that agronomy is currently the major focus for OPRA research, followed by entomology and then plant pathology. Given the collaboration between OPIC and OPRA, initial consultations for the two were carried out jointly. To understand the special capacity needs of the oil palm sector it was first important to understand how the sector operates.

The oil palm industry in PNG is based on the concept of nucleus milling companies and smallholder out-growers. In addition to running mills, companies also grow large plantations of oil palm. Smallholder out-growers consist of both indigenous villagers and settlers who come from outside the mill catchment area. Both the milling companies and out-growers pay to maintain necessary infrastructure — roads, transport, electricity, research and extension services. Challenges of land ownership and other socio-cultural constraints were expected to hinder further expansion into other locations. The smallholder sector covers nearly half of the area under oil palm. However, it only accounts for a third of the actual production, explained by low productivity compared to the plantation sector. Improving productivity in the smallholder sub-sector would seem to be a way of improving incomes.

OPIC's main focus was on organising smallholder farmers to address issues of quality, quantity and timeliness of delivery. These issues included access and use of recommended farm inputs; timely labour supply; socio-cultural factors relating to communal land ownership and associated social responsibilities. Quite clearly, both OPIC and OPRA needed to review their research and extension agenda to address the social, economic, policy and institutional issues that were hindering productivity gains among smallholder producers, and consequently open doors to increased incomes and associated improved livelihoods.

Cocoa and Coconut Institute (CCI)

CCI undertakes cocoa and coconut research and development for the Cocoa Board and KIK (the coconut industry association), respectively. The institute's main cocoa R&D program is undertaken at Tavilo Research Station in East New Britain, while the coconut research division is based at Stewart Research Station in Madang. The Cocoa Board and KIK jointly own CCI. The two boards also serve as regulatory authorities for the two commodities.

The Cocoa Board's main concern is around CCI developing appropriate cocoa-based production and processing systems and technologies for smallholders to produce high quality cocoa beans for export markets. The overarching goal was to improve the net income base for the cocoa farmers and thus contribute to reduced poverty in cocoa farming communities. At the time of the survey, KIK was mainly interested in CCI undertaking relevant research and extension programs to develop appropriate coconut-based production systems and technologies for producing high value coconut products. The overarching goal was to improve the net income base for coconut farmers and thus contribute to reduced rural poverty in coconut farming communities.

The institute had originally existed only as a research organisation, but had recently established an extension arm. Its disciplinary strengths included: breeding, agronomy, pathology, entomology and economics. However, there were indications that the institute was interested in moving towards multi-disciplinary approaches to research and extension. CCI's extension activities included: introducing new technologies (e.g., planting materials), conducting farmer field schools to promote integrated disease and pest management (IDPM) systems, crop husbandry techniques, and product processing. The extension arm of the institute was also responsible for running regional resource centres.

AN OVERVIEW OF THE MAIN FINDINGS FROM THE RECONNAISSANCE SURVEY

The reconnaissance survey highlighted a number of generic issues.

- *Individual organisations had weak service delivery to smallholders.* The NARS organisations were all involved in agricultural research and extension. However, they were all at different levels of organisational

development in terms of actually achieving effective service delivery at the smallholder level.

- *Successful projects and programs but failing organisations.* Many organisations had individually successful projects. However, individually these did not add up to the delivery of the development ambitions found in the strategic plans and organisational mandates that were often articulated in terms of livelihood changes among smallholders at a national level.

- *Lack of coherence of national agricultural research system.* The NARS organisations were all running separately, unlinked at the operational or planning level, without a conscious awareness of an overarching existence of a national agricultural research and extension system. Partnerships with other service delivery organisations in the development and private sector were also weakly developed. Links to policy-making that affected the sector were unclear and governance and institutional arrangements in sector support tended to cloud the picture further.

- *Little attention given to institutional and policy innovation.* The extension efforts of most organisations were focused more on technological possibilities and less on the institutional and policy innovations necessary to ensure widespread adoption of scientific products and services. Given the centrality of service delivery and improved agricultural productivity in each organisation's mandate, it was clear that capacity issues around institutional and policy innovation would need to be included in the scope of the organisational capacity needs assessment process.

IMPLICATIONS FOR THE NEEDS ASSESSMENT PROCESS

The picture that emerged from the reconnaissance survey is not unfamiliar among agriculture research and extension organisations around the world: A group of research and extension organisations locked in an institutional set-up that is premised on the primacy of technology as the key driver for innovation, and where demands for farm level impact from policy-makers are fended off with promises of livelihood changes that organisations had little hope of ever achieving on their own.

On the basis of these findings ARDSF realised that if the NARS organisations were to go through a needs assessment process to define capacity development needs, they would first need to see their current predicament from a different perspective. This different perspective would need to provide a framework to guide the way individual organisations planned their work and managed their results for impact. It would also need to guide how these organisations worked as part of the larger system of agricultural research and extension organisations. This wider system would include the policy and institution environment that conditioned the way they worked and the way the agricultural sector was supported more generally. More specifically this framework needed to provide a different vision of how the NARS organisations could make an effective contribution to a development process that placed smallholder agriculture centre stage.

THE SELECTION OF AR4D AS A GUIDING FRAMEWORK

It was at this point that the ARDSF agricultural research and development specialist started to introduce an AR4D orientation as a potential framework to help the NARS organisations in the re-envisioning of their own capacities. The particular attraction of AR4D was that it provided a framework to explore and address gaps between agricultural research activities and developmental outcomes. This was precisely the capacity building challenge that the reconnaissance survey has identified.

The choice of AR4D was, however, a challenging one. It implied a major reorientation of practice and policy towards innovation (technical, organisational and policy and institutional change) that supports smallholder farmers. It implied that organisational and policy learning would need to be at the centre of a process through which research and extension organisations — and their partners — transformed their way of working in the development process. The approach did not offer a blueprint of how to do this — and, in reality, it did not even have a proven track record of applying its principles in practice. It was going to require a cultural change in and beyond research and extension organisations as well as organisational and policy changes to make it a reality in Papua New Guinea (or, indeed, anywhere else). As will be explained in subsequent chapters this cultural change was contested by different stakeholders at different points during the implementation of ARDSF. As a result one of the key features of implementation was a process of continuous negotiation.

PREPARING FOR THE NEEDS ASSESSMENT

If the NARS organisations were to undertake a needs assessment the starting point was to equip them with an adequate understanding of the principles of AR4D so that they could rethink what capacity might mean in this new perspective.

To prepare for an organisational needs assessment process, a series of consultative meetings were carried out between directors and senior staff of the NARS organisations and ARDSF staff. The meetings focused on defining the scope of the needs assessment exercise and developing an appropriate methodology. It was decided that the assessment would cover capacity needs at both the operational level (how research activities were organised for impact) and at the strategic level (how corporate plans addressed higher-order development objectives). Operational needs would relate to ongoing activities in each organisation, while strategic needs would involve broader organisational and system level issues. This two-level scope was in line with an AR4D orientation.

Given that the methodology was to be a facilitated self-needs assessment, a workshop was the obvious format to conduct this process. But what form would this workshop take, given that it needed to both build capacity for self-needs assessment as well as undertake the actual self assessment? What this meant in practice was that the needs assessment process would need to begin by introducing the NARS organisations to the AR4D perspective on capacity building. This implied front-loading the needs assessment process with a considerable amount of conceptual learning, but there seemed little alternative if the NARS organisations were to dig themselves out of the dominant yet ineffective paradigm of research and technology-led agricultural transformation that they seemed to be stuck in.

METHODOLOGY FOR ORGANISATIONAL CAPACITY NEEDS ASSESSMENT

In selecting material for the needs assessment workshops ARDSF drew from existing material prepared by the International Service for National Agricultural Research (ISNAR), later brought under the International Food Policy Research Institute (IFPRI). ISNAR had a long history of developing organisational capacity building training modules that had been updated in

recent years to accommodate innovation systems perspectives and included specific organisational capacity assessment tools, such as the Organisational Capacity Assessment Tool (OCAT) (IFPRI, 2006) (see box 5.2). This material was used as a resource base by ARDSF, with different modules being selected to develop a tailor-made workshop program for the needs assessment exercise in PNG. The different modules used in the workshops are described in detail below.

To ensure that the ARDSF team was adequately prepared to lead the workshops and associated needs assessment process, two in-house workshops were held to acquaint all resource people with the entire set of workshop materials and rehearse the delivery process. This involved timed presentations and plenary discussions on the appropriateness of the workshop materials and the presentation style. Part of the purpose here was to ensure that the ARDSF team was comfortable and conversant with the conceptual underpinning of the AR4D orientation that it was going to introduce to the NARS organisations.

Following the first in-house workshop all suggestions were incorporated into the workshop materials and the presentation rehearsed again in the second in-house workshop. This process, along with actual delivery of needs assessment workshops, helped tailor the ISNAR materials to the PNG context. It also helped the ARDSF team develop a shared perspective on organisational capacity strengthening and clarify roles for each member of the team.

THE NEEDS ASSESSMENT WORKSHOPS

The following is an overview of the different modules used in the needs assessment workshops. A record of the proceedings of this workshop and copies of materials used can be accessed from the ARDSF archive to be established by NARI (<http://www.nari.org.pg>). The details below draw from the first needs assessment workshop conducted with NARI. Some modifications were made along the way, but the basic format was similar across all organisations. Details of the sessions and accompanying group exercises can be found in the annex to this chapter.

The rationale

- Discuss with the NARS organisation management and senior officers the need for new approaches for agricultural research and extension organisations in order to address challenges of improved impact in

BOX 5.1. NEEDS ASSESSMENT PROGRAM OVERVIEW

Day 1

- Setting the scene: Identifying the challenges and opportunities of the PNG NARS
- AR4D: An alternative approach to scientific research
- How can the AR4D concept be applied?

Day 2

- What individual skills are needed to engage in innovation processes?
- What interpersonal skills are needed to drive innovation?
- What organisational skills are needed to catalyse innovation processes?
- Key features of 'Learning Organisations'

Days 3 & 4

- Institutional Capacity Needs Assessment
- Prioritisation of areas of need
- Framework for development of concept notes (priority interventions)

Source: Authors

production, poverty reduction, sustainable use of resources and the environment

- Create a common understanding among NARS representatives of the organisational processes and capacities needed to support the AR4D agenda

Objectives

- Discuss with the NARS organisation the concept of AR4D
- Prepare staff to play leadership roles in identifying needs and managing any necessary change processes
- Prepare the staff to assess current status of their organisations in delivering on the AR4D agenda
- Identify priority gaps that will inform the development of the intervention programs

Expected outputs

- Participants will develop an understanding of the elements of an AR4D framework
- Participants will gain an insight into the communication and leadership skills required in leading for innovation
- Participants will develop the ability to assess the capacity of their own organisations in the context of the AR4D agenda

- Participants will develop the ability to identify and prioritise interventions

An overview of the workshop program is given in box 5.1.

The capacity needs assessment process was accompanied by the following steps.

- a) Appointment of an “Expert Committee” consisting of representatives across all levels and hierarchies of the organisation. The committee would lead the assessment process and identify capacity strengthening initiatives
- b) Preparation of the committee to become an effective change agent through preparative conceptual and practical sessions

The needs assessment took place at three levels:

- *Individual level:* Where members of the steering committee made personal assessments
- *Group level:* Where individuals negotiated group results
- *Committee level:* Where respective groups negotiated organisational results. These results were finally submitted to the senior management for approval. The approved results formed the basis for negotiations among the NARS to identify cross-cutting issues for collaborative capacity strengthening interventions through Component 2 of ARDSF.

REFLECTIONS ON THE WORKSHOP PROCESS

A few points stand out from the workshop process and the materials used in it.

- Considerable efforts were made in conceptual orientation. This was initially resisted, but later paid dividends as it helped build a shared understanding among all participants. Formal needs assessment exercises did not take place until the third and fourth days of the workshop.
- A number of exercises focused on self-awareness at the individual level to generate awareness of roles and responsibilities as part of the wider endeavour of bringing about change at the smallholder level.

BOX 5.2. OCAT FRAMEWORK

The Organisational Capacity Assessment Tool (OCAT) is a simple tool to help organisations explore their performance in different aspects of their work. This helps them prioritise capacity building needs. The criteria use in the score exercise with the NARS organisations was as follows:

- Organisational autonomy
- Governance and leadership
- Management and administration
- Managing and using funds
- Technical capability
- Developing and maintaining staff
- Organisational culture
- Collaboration and interaction with key stakeholders
- Mainstreaming of gender and HIV/AIDS

Source: IFPRI (2006)

- Group work was used to reinforce theory sessions on new visions of research for development.
- Sessions on gender and HIV/AIDS were included to help mainstream these in needs assessment and subsequent capacity building processes.
- Formal scoring exercises (based on the OCAT framework, see box 5.2) were used to identify capacity building priorities and this provided concrete workshop outputs that could form the basis of subsequent capacity building interventions.

OUTCOME OF THE NEEDS ASSESSMENT PROCESS

The needs assessment exercise had three sorts of outcomes. The first sort was the understanding that staff of the research organisations had about a new vision of agricultural research for development. This is not to suggest that all staff were transformed by the workshops. Nevertheless, the workshops had begun a process whereby NARS staff started to reflect on a different way of conceiving their role and their organisation's role within the wider innovation and development process. The second sort of outcome reinforced this cultural change. This was the formation of committees within each organisation,

TABLE 5.1. SUMMARY OF CAPACITY NEEDS ASSESSMENT RESULTS FOR SIX NARS ORGANISATIONS

Performance Indicators	CCI	CIC	FPDA	OPIC	OPRA	NARI
Organisational Autonomy	3.2	3.7	3.9	4.3	4.4	3.2
Leadership	2.8	2.8	2.6	4.3	4.5	3.7
Management	2.7	2.2	2.0	3.7	4.3	3.4
Administration	2.4	1.8	1.8	3.5	3.9	3.4
Managing & Using Funds	2.8	2.7	2.3	3.4	4.5	3.9
Technical Capability	2.8	2.4	2.5	3.3	3.5	3.1
Farmer Focus	2.1	2.4	2.4	3.1	3.1	3.0
Development & Staff Maintenance	2.8	2.4	1.8	3.4	4.2	2.9
Organisational Culture	2.3	2.4	2.4	4.0	4.3	3.8
Interaction/ Collaboration with Key Stakeholders	2.9	2.2	2.2	3.4	3.5	3.4
Gender Mainstreaming	2.0	2.1	2.6	2.5	2.8	3.1
HIV/AIDS Mainstreaming	1.0	1.0	1.2	1.8	1.4	2.4

Key: Rating scale ranged between 1 and 5:

1 = Needs urgent attention and improvement

2 = Needs attention

3 = Needs improvement

4 = Needs improvement in limited aspects

5 = No need for immediate improvement

Source: ARDSF (2007).

which would be responsible for coordinating and championing the process of rethinking and organisational transformation. In a sense these committees were responsible for ensuring that the new culture of AR4D was formalised in administrative and operational terms.

The third sort of outcome was the result of the formal needs assessment process itself: the scoring of the OCAT framework. The results of this exercise are illustrated in table 5.1. Beyond the details of these scores, what is important to note is that it revealed to the organisations the broad areas of performance and capacity building that needed to be addressed. This, in turn, gave the NARS organisations a basis for articulating the sort of support they would need from ARDSF.

NEXT STEPS: ARTICULATING DEMAND FOR SUPPORT FROM ARDSF

Following the self-assessment, each NARS organisation undertook extensive work to define appropriate responses to their identified needs, based on the scoring from the OCAT exercise. This resulted in 76 project concept notes. ARDSF then developed a framework to group requested support into broad generic categories. The purpose of this grouping was to ensure that the identified needs had commonality across the organisations to form a basis for collaborative programs and activities, and then provide a hierarchy of priorities within and across organisations.

The groupings developed, and the rationale for these, were as follows:

- 1) *Enhanced responsiveness to client needs:* The NARS organisations recognised that they needed to strengthen their capacity to address practical and strategic issues affecting diverse clients and stakeholders. Key among these issues, in the context of PNG smallholder agricultural producers, were challenges and opportunities associated with prevailing biophysical, economic, socio-cultural, policy and institutional conditions. These conditions ranged from production systems to value chains. Since biophysical scientists predominantly staffed the research organisations, new capacities were needed to conduct socio-economic surveys, sub-sector studies and GIS-based mapping to assist in effective targeting of diverse needs.
- 2) *Institutionalising planning, monitoring and evaluation:* The needs assessment process established that the NARS organisations were only accountable at the project level for resource use but not for impact. It was, therefore, necessary to develop organisational capacity to plan, implement and account for an impact-oriented research

and extension portfolio, supported by an effective monitoring and evaluation system.

- 3) *Enhanced institutional leadership and governance:* The needs assessment process established that although PNG agricultural research and extension organisations had been restructured several times in the past, governance issues continued to haunt them. It was, therefore, agreed that leadership and management courses would need to be delivered at various operational levels with a view to examine prevailing core values and associated organisational norms. This would be followed by a review of organisational strategic plans and the associated research portfolio, organisation and management systems, monitoring and evaluation systems, performance assessment processes and the associated reward systems. This was seen as the way to develop new “rules of the game” for more effective service delivery.
- 4) *Mainstreaming gender in agricultural research:* The needs assessment recognised that while women continued to play a critical role in PNG agriculture, they remained vulnerable and powerless in decision-making on household resource allocation and income distribution. The NARS organisations considered it necessary to address this anomaly in order to catalyse effective agricultural development. The NARS organisations and associated service providers committed to develop and implement gender-sensitive organisational policies and procedures, programs and projects; consequently mainstreaming gender in all aspects of organisational behaviour.
- 5) *Mainstreaming HIV/AIDS in agricultural research:* The needs assessment exercise also recognised the emergence of the HIV/AIDS epidemic and noted that its impact on the agricultural sector was not appreciated by policy-makers and communities at large. The NARS organisations committed to conduct necessary studies and work in partnership with specialised agencies to develop appropriate policies, programs and projects to address this.
- 6) *Networking and partnerships for effective collective action:* The needs assessment exercise helped the NARS organisations come to terms with the diverse range of client and stakeholder needs in the agricultural sector. This made it apparent that the NARS organisations

could not service such complex needs in isolation. They needed to build capacity for collective action to deliver the complex research for development agenda. This would require new partnerships and networks.

- 7) *Capacity building for effective communication in the NARS:* The NARS organisations in Papua New Guinea felt relatively comfortable communicating within their own organisations. However, with the emerging commitment to deliver and account for results through complex partnerships, there was increased need for more effective communication to facilitate internal decision-making processes; to guide anticipated collective action among collaborating organisations; and to facilitate widespread technological, policy and institutional innovations associated with research for development.
- 8) *Capacity building for enhanced technical services in the NARS:* Despite the significance of analytical tools in scientific processes, the needs assessment revealed that there were serious limitations in the NARS. However, some of the required analytical tools were expensive to procure and maintain. Thus, the NARS resolved to promote the development of shared facilities for cost effectiveness and ultimate sustainability.

KEY FEATURES OF THE IMPLEMENTATION PLAN

The needs assessment process described above took place over the first 12 months of ARDSF. A workplan for the facility was then developed, led by ARDSF'S agricultural research and development specialist. The workplan had a number of features. It identified AR4D as the central framework for planning, executing and monitoring and evaluating the capacity building process with the NARS. It involved a series of activities that would help the NARS organisations and their partners and stakeholders retool for the AR4D agenda. This included all six NARS organisations and made explicit links between the organisational development component of ARDSF and its competitive grants component. The retooling activities were broad-based in scope. They involved introducing an entirely new way of working that was results-driven and relied on iterative organisational learning. They sought to change both the mind-set of individuals, as well as the organisational structures and strategies that shaped the way they worked and the way they related to

others in the agricultural research for development system. The entire process involved helping the NARS organisations take a much more proactive role in the policy-making process that affected the smallholder agricultural sector.

The selection of an AR4D orientation at the beginning of the needs assessment process had not been universally welcomed, even within ARDSF. Tension had become apparent during the needs assessment process. AR4D was criticised for being too conceptual and for being a distraction from what many saw as the real purpose of ARSDF — improving technology transfer. These tensions were heightened by what many saw as a protracted needs assessment process and a lack of evidence of activities on the ground that would have impact. Of course, these tensions were the result of two very different visions of how agricultural research contributed to innovation and impact. AR4D was recognised as challenging and different and these tensions were the price of trying something new. It would have been surprising if it were not contested.

These tensions, however, came to a head with the development of the implementation strategy and workplan at the end of the inception phase. The operational wing of ARDSF considered the proposed strategy to be unacceptable and unworkable and called in an external team to develop an alternative plan. This alternative plan followed fairly conventional lines and focused on building capacity in the extension-like functions of the NARS organisations. Unlike the AR4D strategy it also proposed working only with few and not all six of the NARS organisations concerned, as some of them were deemed to be “beyond help”.

By this time ARDSF had set up a NARS technical committee as a governance mechanism for the facility. This was made up of senior representatives of the NARS organisations and other sector stakeholders. Its purpose was to provide technical oversight to the plans and support activities that ARDSF was providing. By the time the alternative implementation plan was presented, the technical committee had accepted and was starting to champion the AR4D capacity building vision. It reviewed the alternative implementation plan and completely rejected it.

This was a critical decision point in the development of ARDSF. It brought about senior staffing changes within ARDSF which, although not uncontested, made it possible for the AR4D implementation strategy to be accepted and move ahead. An inception review 18 months into the life of ARDSF broadly endorsed the approach that had been chosen.

LESSONS

Rapid initial diagnosis. A reconnaissance survey was valuable in starting off a process of dialogue with the NARS organisations about the challenges they were facing and about the sort of needs assessment process that could be used to design capacity building support.

Creating a generic and systemic vision of capacity building. The selection of a framing vision of the capacity building agenda — AR4D — that was generic enough to be relevant to all the NARS organisations, irrespective of their mandates and stages of organisational development, proved critical. This allowed all the NARS organisations to embark on a needs assessment process focused on the same development objective. It made the links between different organisations explicit and this supported ARDSF's purpose of creating a coherent national agricultural research system. The role of an agricultural research and development specialist in ARDSF to develop this generic vision was critical.

Combining capacity building and needs assessment. A self-needs assessment approach was chosen. This required building the capacity of organisations to conduct their own needs assessment. This had benefits beyond the capacity building exercise, as it was the beginning of a process of changing the way the NARS organisations perceived their role in the wider development process. It alerted them to the fact that this changed perception had implications on the way they worked. This was of equal importance to the formal aspects of identifying capacity building needs and priorities.

Tailor-made workshop material. Workshop material was drawn from existing organisational development modules, but tailored to the needs of the capacity issues scoped in the reconnaissance survey.

Building strong conceptual foundations. The needs assessment workshops spent considerable time on conceptual orientation. Despite resistance, this paid dividends during the formal needs assessment exercise. This was also a sound basis for developing action plans for the activities that followed the needs assessment exercise.

Creating champions of the new vision from the start. ARDSF created technical and governance committees during the needs assessment and inception phase, drawing on members from the NARS organisations and

their stakeholders. This helped create a community of champions that could defend the new approach both within the NARS organisations and ARDSF and beyond.

Expecting new capacity building visions to be contested. The inception phase of an intervention is also a period of contesting views on how to proceed. The adoption of AR4D as a framing vision for capacity building is a radical departure from normative, “business as usual” approaches that characterise traditional agricultural research and development practice. This means that such an approach is usually going to be fiercely contested by a range of stakeholders. Dealing with this requires patience and diplomacy. Developing a community of champions within the NARS organisations was one valuable tactic for dealing with this and helping ensure that the new capacity building vision was adopted.

TECHNICAL ANNEX

SESSIONS AND EXERCISES IN THE NEEDS ASSESSMENT WORKSHOP

Session 1: Opening for dialogue

Exercise 1: Icebreaker

The exercise was aimed at creating an atmosphere for open dialogue and discussion among the participants and the facilitators. It was well received and provided a lively start the workshop.

Session 2: The Papua New Guinea agriculture sector and the supporting institutions

Review of the situation facing the agriculture sector at large, with particular reference to the National Agricultural Research System in the country.

Exercise 2: Setting the scene: Reflecting on the agricultural sector and the National Agricultural Research System in PNG

Participants were engaged in a discussion on the significant changes that may or may not have occurred in PNG agriculture in the past 15 years.

Session 3: Agriculture Research for Development: An alternative approach to scientific research.

AR4D was presented to the participants and discussed as an alternative approach to agricultural research that provides a framework for a holistic way to address farmers' livelihood needs.

Exercise 3: The exercise aimed to compare the AR4D system with competing concepts, such as typical agricultural research organisations, to increase understanding among participants.

Session 4: What do we need to lead and manage innovators? The domains of human learning

Exercise 4: Leadership skills (personal characteristics or attributes questionnaire).

The exercise aims to assist participants in thinking about how effectively they can use their personal attributes to carry out leadership functions. The

exercise required participants to rate themselves against 25 statements on a scale of 1-5 on how effective they are in fulfilling these functions.

Session 5: Improving interpersonal relationships

This session looked at the importance of understanding the perceptions people have of themselves, of other people, and those that other people have of them in facilitating effective interpersonal communication. The efficiency of a manager depends not only on his /her technical experience and knowledge but also on the quality of his/her relationships.

Exercise 5: Self and pair-wise analysis

In this exercise, participants were asked to reflect on themselves, remembering how they relate to people at work and at home.

Session 6: Interdisciplinary Team building

A brief presentation was made on the importance of positive interdisciplinary team work in participatory agricultural research. This highlighted the value of interdisciplinary teams in integrating different disciplines and allowing research to address subjects that lie beyond the expertise of individual scientists.

Exercise 6: Conflict resolution

Participants were asked to list causes of conflict in any interdisciplinary teams in which they have been involved, the strategy that was adopted to resolve that conflict, the advantages and disadvantages of that strategy, and the lessons learnt from that exercise.

Session 7: Leaders in learning organisations

A presentation introduced the participants to the concepts of learning organisations; creative tension; leadership roles and required skills in learning organisations

Exercise 7: Reflecting on leaders in the learning organisation

Participants were asked to work in four teams to discuss the new roles of leaders as designers, teachers, and stewards and the attitudes that would make each role successful. The impact of each on the organisation was also discussed.

Session 8: Learning organisations

A brief presentation on learning organisations explained that they were

characterised by the ability to continuously recreate themselves by expanding their capabilities to cope with changing environments and the corresponding challenges and opportunities.

Session 9: Internal environmental analysis: Strengths and weaknesses

The internal environment analysis process was introduced as an assessment of an organisation's ability to fulfill the organisational objectives. The assessment focused on the characteristics/quality of the inputs (financial, physical and human), and the effectiveness of processes (human resources, quality assurance, monitoring and evaluation of research programs, etc.), and the value of the products/services to meeting farmer needs.

Session 10: Nutrition and HIV/AIDS

The session provided a summary on the trends of HIV/AIDS infections in the country and the importance of better nutrition for those affected in maintaining a better quality of life.

Session 11: Institutional capacity needs assessment for the concerned NARS organisation

This was the main focus of the workshop. All the conceptual sessions were provided to prepare participants for the organisational capacity needs assessment. The needs assessment sessions were conducted on the third and fourth days on the workshop.

The actual capacity needs assessment covered nine different capacity areas.

- Organisational autonomy
- Governance and leadership
- Management and Administration
- Managing and Using Funds
- Technical Capability
- Developing and Maintaining Staff
- Organisational Culture
- Collaboration and Interaction with Key Stakeholders
- Addressing Gender and HIV/AIDS issues in the Workplace

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Facilitating Agricultural Research for Development in Selected PNG NARS Organisations

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INTRODUCTION

This chapter sets out the main operational steps in using AR4D to frame capacity development. These steps include: the NARS developing concept notes of activities to address capacity building needs and the refinement of these into eight capacity building themes taking into account: results-based strategic planning; results-based program planning; development of impact-oriented projects; results-based organisation and management systems; and results-based monitoring and evaluation. The experience of ARDSF highlights a number of lessons about capacity building framed by AR4D: (1) It is a long-term ongoing task; (2) It involves building new skills and new organisational cultures; (3) It works best when it is an inclusive and participatory process; and (4) This approach to capacity building is experimental and iterative.

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RECAP: AR4D AND ORGANISATIONAL DEVELOPMENT

An AR4D orientation implies making the links between research and development outcomes explicit. As a way of framing capacity building this has implications for all aspects of the organisational development process — from planning, organisational and program structures to monitoring and evaluation. A fundamental principle is that all planning and implementation processes need to be explicitly linked to results. Implementation strategies not only have to be linked to results, but they must explicitly include arrangements where research activities are connected to other development organisations that need to be involved in the process in order to achieve development outcomes. Another critical aspect of capacity building framed in this way is that organisational cultures need to be reoriented towards a results-based, collaborative way of working.

INTRODUCING THE PROCESS

The ARDSF design was based on the premise that different PNG NARS organisations were at different levels of organisational development. Bearing this in mind, it was necessary to tailor the direction and pace of organisational development to fit the level that each organisation had reached.

However, while recognising the individual needs and circumstances of each organisation, part of ARDSF's support also needed to focus on helping organisations work together as an effective national agricultural research system (NARS). The NARS organisations involved in this capacity development process were: the Cocoa Coconut Institute (CCI), the Coffee Industry Corporation (CIC), the Fresh Produce Development Agency (FPDA), the National Agriculture Research Institute (NARI), the Oil Palm Industry Corporation (OPIC) and the Oil Palm Research Association (OPRA) (see chapters 3 and 5 for more details on these organisations).

The capacity development process facilitated by ARDSF began with a comprehensive organisational needs assessment process (this is described in chapter 5 and a detailed case study of NARI is provided in chapter 7). The needs assessment process (see chapter 5) identified a generic issue that was common to all the NARS organisations — the apparent disconnect between the research they did and the development outcomes expected of them by their clients and stakeholders.

This process highlighted the following needs:

- The alignment of research agendas with expected results
- The building of necessary partnerships to deliver the results
- The alignment of organisation and management systems with a results framework couched in developmental terms
- The identification of resourcing mechanisms for the results
- The embedding of monitoring and evaluation systems into learning and decision-making processes

Given the complexity of this type of institutional transformation, the NARS organisations chose, in consultation with ARDSF, to adopt a learning-by-doing approach. In this process, the role of the ARDSF team was to provide facilitation and, where necessary, arrange capacity building activities to support the learning-by-doing processes. To launch the process, the NARS organisations developed concept notes articulating their organisational development needs from their own perspectives. The role of the ARDSF team was to dialogue with the NARS organisations to help ensure that these concept notes reflected the capacity building needs identified in the needs assessment process. The working groups established by each organisation selected priority activities based on these concept notes and these selected activities were discussed and approved by the NARS Coordination Committee (the governance mechanism for ARDSF). These activities were funded through ARDSF annual plans and this formed the basis of the capacity development support ARDSF provided to the NARS organisations.

The following section provides details of this concept note development process and the subsequent capacity development activities that ARDSF facilitated with the NARS organisations.

DEVELOPING A PROGRAM OF SUPPORT FOR THE NARS ORGANISATIONS

As indicated above, the first step in this process was for the NARS organisations to develop concept notes on what they considered to be priority areas for capacity building⁵.

⁵ These included: 30 from CCI, 14 from CIC, seven from FPDA, 12 from NARI, eight from OPRA, and a complex one from OPIC.

A review team from ARDSF analysed and synthesised the concept notes and provided feedback to the NARS organisations. Overall, the concept notes reflected specific operational needs (infrastructure, human resources and specific research projects) rather than the broader organisational competencies required to deliver improved services to smallholders. The ARDSF facilitators combined related concept notes to create eight broader capacity building themes. The development of these themes built on the issues identified in the needs assessment process, — besides being informed by the AR4D perspective that was guiding the entire process. Proposed capacity building themes were circulated to the NARS leaders for comments, and eventually presented in a NARS Consultative Workshop⁶ for consideration and approval. The eight capacity building themes can be summarised as follows:

- *Enhanced responsiveness to client needs*: Capacity to address practical and strategic issues affecting diverse clients and stakeholders.
- *Institutionalising planning, monitoring and evaluation*: Organisational capacity to plan, implement and account for an impact-oriented research and extension portfolio, supported by an effective monitoring and evaluation system.
- *Enhanced institutional leadership and governance*: Leadership and management courses to review and address prevailing core values and associated organisational norms. Review of organisational strategic plans and the associated research portfolio, organisation and management systems, monitoring and evaluation systems, performance assessment processes and the associated reward systems.
- *Mainstreaming gender in agricultural research*: Capacity to develop and implement gender-sensitive organisational policies and procedures, programs and projects; consequently mainstreaming gender in all aspects of organisational behaviour.
- *Mainstreaming HIV/AIDS in agricultural research*: Capacity to conduct necessary studies and work in partnership with specialised agencies to develop appropriate policies, programs and projects to address the mainstreaming of HIV/AIDS.

⁶ Held in August 2007, participants in the workshop included the NARS senior management and representatives of their boards, key stakeholders from the agricultural sector (public, private and non-governmental organisations), and donor representatives.

- *Networking and partnerships for effective collective action*: Capacity for collective action to deliver the complex research for development agenda. This would require new partnerships and networks.
- *Capacity building for effective communication in the NARS*: Capacity for more effective communication to facilitate internal decision-making processes; to guide anticipated collective action among collaborating organisations; and to facilitate widespread technological, policy and institutional innovations associated with research for development.
- *Capacity building for enhanced technical services in the NARS*: Despite the significance of analytical tools in scientific processes, the needs assessment revealed that there was serious limitations in the NARS in using them. Some of the required analytical tools were also expensive to procure and maintain. Thus, the NARS resolved to promote the development of shared facilities for cost-effectiveness and ultimate sustainability.

IMPLEMENTATION STRATEGY

The identified capacity building themes listed above acted as guidelines for what capacity building efforts ARDSF would need to make with each organisation. However, the precise nature and sequence of these deliverables needed to be defined in consultation with the leadership of each organisation.

To facilitate this process NARS working groups (NWGs) and Organisational Working Groups (OWGs) were created. The NWGs, which also formed the governance interface with ARDSF, had the role of defining collaborative capacity development initiatives among the NARS organisations. The OWGs had the role of defining activities specific to each organisation. In designing intervention strategies for the capacity building efforts, both working groups needed to consider appropriate entry points, logical sequencing of interventions, areas of synergy among varying interventions, and absorptive capacities in different organisations. Both working groups also had the role of identifying any necessary technical advisory support from ARDSF. The working groups reported through their own organisational structures and informed ARDSF. The ARDSF rationale for proceeding in this way was that it was expected to enhance a sense of ownership of the capacity building process among the NARS.

The main elements of the capacity building process was a series of workshops addressing the following:

- Results-based strategic planning
- Results-based program planning
- Development of impact-oriented projects
- Results-based organisation and management systems
- Results-based monitoring and evaluation
- Gender and HIV/AIDS mainstreaming

KEY ELEMENTS OF ORGANISATIONAL CHANGE IN THE PNG NARS

The development of results-based strategic plans⁷

All the six NARS organisations supported through ARDSF chose to use strategic planning processes to address key organisational concerns identified through the needs assessment exercise. Key among the identified concerns was the need to re-orient research and extension agendas to meet varying client needs. To achieve this objective, the strategic planning process needed to be framed within the prevailing PNG government policy frameworks⁸ and be seen to be responding to the needs of varying clients and stakeholders in the agricultural sector. The process also needed to be widely consultative to ensure broad-based support in the agriculture sector.

The strategic planning framework introduced by ARDSF was based on an AR4D orientation. As already discussed, this framework suggests that research and development organisations ought to be aligned to sub-sector, sector and ultimately, national development goals. The approach recognises that achievement of people-level impact takes complex organisational and developmental processes, including interdisciplinary teamwork, partnerships, integration of technological, institutional and policy solutions and participatory processes. The strategic planning process used an action learning and participatory approach, comprising four stakeholder workshops,

⁷ FPDA Corporate Plan, July 2009; CCI Strategic Plan, May 2009; CIC Strategic Plan, June 2010; OPIC Strategic Plan, June 2010; OPRA Draft Strategic Plan, January 2011.

⁸ Vision 2050; National Development Strategic Plan 2030 (NDSP); NADP 2007-2016; MTDS 2011-2015.

environmental analysis, synthesis and an initial drafting followed by stakeholder consultations and endorsement. The workshops were attended by representatives of the NARS boards, senior management and other stakeholders such as farmers, traders, processors, wholesalers, research and development organisations and relevant government departments.

Each strategic planning process was preceded by leadership and management courses. This was to provide the opportunity for key actors to develop a shared perspective on their role as individuals, teams, organisations and critical parts of the national agricultural research system in the PNG agricultural development process. Following the courses, key actors were facilitated to identify core values and guiding principles that would guide delivery of expected organisational results — outcomes and impact. Key actors were subsequently helped to develop shared visions and to translate these into verifiable organisational goals.

With these organisational goals in mind, key actors were facilitated to develop medium-term missions and to translate these into achievable and verifiable organisational strategic objectives (the deliverables that each organisation was responsible for; in logframe terms this is the organisation's purpose). Thematic objectives were subsequently identified to deliver organisational strategic objectives. Thematic objectives were the deliverables that individual programs of work within the organisation would be responsible for delivering (in logframe terms this was the program's purpose). For these hierarchies of objectives, indicators of success were agreed upon, forming the basis of the organisational monitoring and evaluation (M&E) system. This was a shift from the NARS organisations' previous approach to M&E that was only done at the level of individual projects. This new structure filled the gap between individual projects and organisational objectives with an intermediary thematic or program level objective. This made the organisational level objective achievable.

In this program structure and M&E system the chief executives were responsible for delivering the results promised in strategic plans, with oversight from the boards of governors of each organisation. Actual implementation was through thematic program leaders. Each program leader was responsible for planning each thematic program and developing a portfolio of linked projects to deliver medium-term thematic results. Because the thematic programs were couched in developmental terms the projects involved in these were anticipated to go beyond research. The delivery process would depend on broad-based

partnerships among public, private, non-governmental and community-based organisations. This, in turn, would require new funding mechanisms (this is discussed further in chapter 11).

The different NARS organisations adapted the strategic planning process to suit their varying contexts. This is best illustrated through mini case studies of strategic planning in each of the NARS organisations. It is important to note that the strategic planning process, over and above helping define new structures and performance monitoring systems, created a debate within these organisations about their purpose and how to achieve it. This, in some cases, made a significant impact on the culture of the organisation. Of equal importance was the way it helped reconcile different opinions and expectations of researchers, management, governing boards and sector stakeholders. There was clearly a significant amount of pent-up dissatisfaction within these organisations and among their stakeholders. The strategic planning process provided an opportunity to air this dissatisfaction and involve stakeholders in the development of a plan to resolve this. Also worth noting is the way organisations leveraged the strategic planning process in negotiations with donors for new funding.

Case Studies of the Strategic Planning Process

1. Strategic planning in the Fresh Produce Development Agency

The FPDA took a step-by-step approach to its strategic planning process despite the frequent changes to the post of Chief Executive Officer (CEO). The first CEO oversaw the needs assessment process and began planning for strategic planning. The second CEO led the first half of the strategic planning process. The third CEO, who was selected from within the organisation, participated in both strategic planning and subsequent program planning processes. Throughout the planning process, the chairman of the board, backed by the executive committee of the board, played a significant leadership role. At the end of the process, FPDA emerged a more coherent and stable organisation. The process helped harmonise stakeholder expectations with those of the board and management.

2. Strategic planning in the Coffee Industry Corporation

In CIC both the needs assessment and the strategic planning processes were led by a long-standing CEO. The CEO had previously led the organisation through several restructuring processes without visible changes in service delivery. The senior management was, therefore, under pressure to provide convincing

solutions to the board and the broader stakeholder community. During the needs assessment process led by ARDSF, the senior management was already formulating a new strategic plan with the support of Australian volunteers. However, the needs assessment process introduced AR4D concepts that the senior management thought would be helpful in addressing concerns raised by the clients and stakeholders — namely, weak service delivery and impact. The senior management requested ARDSF support, but preferred not to use the step-by-step approach that the AR4D methodology offered. Consequently, ARDSF support was provided in only one workshop. While this opportunity added value to the ongoing process, it turned out to be too scanty to reconcile the competing factions in the board and the senior management. Consequently, the long-standing CEO had to leave, and was followed soon after by several key members of the senior management team. The incoming CEO accepted further assistance to revise the strategic plan with greater involvement of the board and other key stakeholders. This helped provide a widely-owned plan that laid a firm foundation for subsequent results-based program planning.

3. Strategic planning in the Cocoa and Coconut Institute

As in FPDA and CIC, the strategic planning process in CCI was led by several acting CEOs. At the start of ARDSF support, CCI was already involved in strategic planning with support from Australian volunteers. However, the process was proceeding without the involvement of the board of directors or even the senior management team. The CEO found himself pulling in one direction, while senior management was pulling in a different direction. In the end the CEO had to leave the organisation. He was replaced by an interim CEO from outside the organisation, who did not last long enough to make an impact. The third CEO was appointed from the board but also in an acting capacity. Having previously worked in CCI, the new CEO provided an opportunity for a participatory and widely consultative strategic planning process. In the end, the process helped to harmonise client and stakeholder expectations with those of the senior management and the scientists. In this way the strategic planning process helped resolve long-standing organisational conflicts and provided a widely supported sense of direction. This laid a solid basis for results-based program planning.

4. Strategic planning in the Oil Palm Industry Corporation

It took a long time for OPIC to initiate strategic planning with ARDSF support. This was partly because the organisation still had a valid strategic plan and partly because it was engaged in planning a World Bank-supported project. There was also an overarching problem of an acting CEO and an

expired board term. However, as the other NARS organisations continued to report on the progress they were making in addressing key organisational challenges, the OPIC management became interested and requested support. OPIC chose to go through all the steps suggested by an AR4D orientation. Tensions arose between the smallholder oil palm producers who agreed on the challenges and opportunities identified in the sub-sector, and representatives of the oil palm plantations, who appeared continuously antagonistic. Finally, the strategic plan was endorsed by both the smallholder producers and the plantation representatives, although the latter were reluctant. With this consensus reached, the government responded by appointing a new OPIC board. However, by the time the endorsement was achieved, there was little time left for ARDSF support to translate the strategic objectives into medium-term programs and short-term projects. A work plan was developed to solicit support from the World Bank project.

5. Strategic planning in the Oil Palm Research Association

The OPRA story was much more complicated. With loyalty to both the plantations and the smallholder oil palm producers, OPRA took a more independent approach — seeking different stakeholder opinions in separate sessions and hoping to reconcile them in plenary sessions. This *ad hoc* approach generated lots of data that was difficult to interpret into a coherent plan. In the end, two competing solutions emerged: the need for a policy and regulatory organ driven by the plantation representatives and the need for a reformed OPRA driven by the smallholder oil palm producers. The plantation representatives funded the creation of the policy organ and vetoed the option of a reformed OPRA.

Details of strategic planning in NARI are discussed in chapter 7.

The Development of Results-Based Program Plans

As in the strategic planning process, program planning was guided by the AR4D framework. Within this framework, program plans are supposed to be aligned with organisational strategic plans. Indeed, in this approach, programs are automatically generated by strategic plans as necessary deliverables to achieve expected organisational outcomes and impact. Thus, in a cascading⁹ fashion, respective program goals reflect organisational purpose, as program purposes

⁹ Cascading logic consists of overarching logical frameworks at different levels of operation — e.g., agricultural innovation system, agricultural research for development system, research organisation, programs and projects. See chapter 10 for more detail.

reflect organisational outputs. As discussed in relation to the development of strategic plans, the logic of this framework is that if programs achieve their purposes, then organisational outcomes and impact would automatically be achieved. Program planning was, therefore, concerned with identifying and prioritising different types of projects necessary to deliver expected program results — outputs and outcomes. Thus ARDSF offered to support program formulation processes only for those NARS organisations that had completed strategic planning processes. Within the lifetime of ARDSF, this was only possible for CCI, CIC, FPDA and NARI.

The program planning process was conducted through two externally-facilitated workshops and pre- and post-workshop analytical activities. The workshops were attended by the NARS senior and middle management, representatives of boards of governors, provincial departments of primary industries, smallholder farmer associations, non-governmental organisations and institutional working groups. The pre-workshop activities involved analysis of the development domains and related sub-sector studies.

Development domains were developed based on similar agro-ecological conditions, socio-economic circumstances and proximity to the markets. This was used as a way to cluster clients in similar circumstances and shared aspirations for targeting purposes. Sub-sector studies characterised different production systems and identified their linkages to the market through relevant value chains.

In the first workshop, participants defined the development domains, and reviewed results of the sub-sector studies. From this they defined sub-thematic objectives and conducted constraint and opportunity analysis for each development domain. For example, in NARI's Enabling Environment Thematic Area/Program, the following sub-themes were identified: marketing opportunities, socio-cultural environment, land mobilisation, socio-economic services, institutional arrangements and income earning opportunities.

In the second workshop, participants converted constraint-trees into objective-trees. Constraint-trees identified causal pathways for priority constraints in each development domains. This helped identify root causes of the key constraints to avoid addressing symptoms of the identified problems. Objective-trees identified causal pathways of priority objectives in each development domain. These formed the basis for generating project ideas to deliver expected results. Workshop participants then identified, prioritised

and consolidated a portfolio of different types of projects necessary to deliver different program objectives in each of the development domains.

Logical frameworks were formulated for each of the projects, articulating project goal, purpose and outputs. The hierarchies of objectives were further clarified by verifiable indicators, means of verification and important assumptions that would need to hold true for the expected results to be achieved. The logic here was that projects would need to be implemented by project leaders under the guidance of the program leaders. Considering the complexity of the results-based projects, it was also anticipated that they would need to be implemented in partnership with other organisations — research, non-research; public, private, non-governmental and community-based organisations.

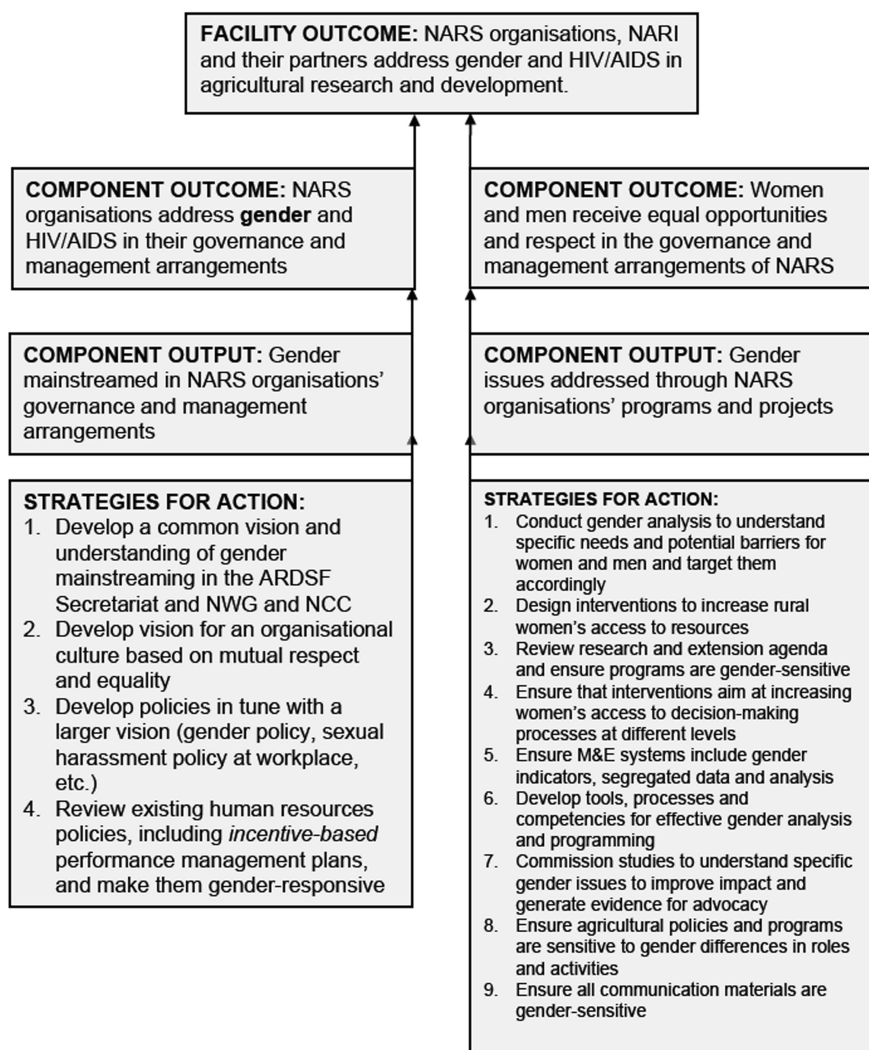
Gender and HIV/AIDS Mainstreaming

The ARDSF design laid emphasis on mainstreaming gender and HIV/AIDS. Both issues were perceived as critical to addressing socio-economic conditions of smallholder agricultural producers in PNG. Gender mainstreaming focuses on both men and women, but there was a need to look particularly closely at the role of women, because in the past women had been largely ignored as economic producers. Within this context, mainstreaming was defined as the process that takes into account the implications of gender and HIV/AIDS in any planned action, including organisational policies, regulations, programs and projects in all areas and at all levels. Consequently, mainstreaming would ensure men, women, boys, girls, and people infected and affected by HIV/AIDS benefited equitably from all initiatives supported by ARDSF. Figure 6.1 illustrates key elements of the strategic framework developed by ARDSF to guide mainstreaming of gender and HIV/AIDS.

To ensure that their programs and projects were gender-sensitive and responsive to those infected and affected by HIV/AIDS, the NARS needed to:

- Conduct analysis to understand specific needs and potential barriers for women, men, boys and girls, and those infected and affected by HIV/AIDS
- Review research and extension activities to ensure programs and projects were gender-sensitive and responsive to those infected and affected by HIV/AIDS

FIGURE 6.1. GENDER AND HIV/AIDS MAINSTREAMING FRAMEWORK



Source: ARDSF (2009)

- Ensure increased access to decision-making by women, men, boys and girls, and those infected and affected by HIV/AIDS
- Ensure monitoring and evaluation systems report on issues relating to gender and HIV/AIDS

With support and encouragement, the NARS organisations also developed their own gender and HIV/AIDS strategies and action plans. To implement their action plans, the NARS appointed focal persons for gender and HIV/AIDS, including at the regional centres.

In addition, NARS staff, especially professional women, undertook initiatives for local action in their respective communities by organising and assisting womens' groups in informal businesses and formal economic activities¹⁰. Support was also given to programs where women were leaders and champions, resulting in developing a cadre of influential women leaders¹¹. These voices were prominently heard in national development policy debates¹², in the development of NARS' strategic plans, program planning and project formulation processes. This representational role helped entrench women's perspectives and interests in critical decision-making processes to their advantage. Furthermore, most of the projects led by women tended to focus on economic empowerment of women.

Aligning Organisational Structure and Process to the Results Framework

To align organisational and management systems with the organisational results frameworks, ARDSF used the Strategic Management and Development of Human Talents (SMDHT) framework (this is discussed in more detail in chapter 8).

¹⁰ For e.g., Dr. Jane Ravusiro, a senior scientist with CCI, provided assistance to local women to work on informal businesses, and educated spouses of ancillary staff on addressing gender issues, including family domestic violence and HIV and AIDS. Ms. Cathy Pianga, a senior projects officer with CIC, advised and assisted PNG Women in Coffee in Goroka to organise and have greater participation in the industry along coffee value chains. Ms Barbara Tommy of NARI actively organised local women outside of Lae in building the emerging cut flower market in Lae and other selected areas in PNG.

¹¹ For e.g., Mrs. Maria Linibi of PNGWiADF; Mrs. Monica Otto of FOWIAD; and Ms. Theresa Arek of Pacific Spices Ltd.

¹² For e.g., in the Consultative Implementation Monitoring Council (CIMC) meetings.

In addition to managing and developing the technical knowledge and skills of people working within an organisation, SMDHT promotes other talents such as imagination, visioning, creativity, non-technical knowledge, intuition, communication, leadership, learning ability, the ability to work in teams — all critical for innovation.

The SMDHT framework (illustrated in Figure 6.2) calls for (1) *total*, (2) *external*, (3) *strategic* and (4) *internal* integration of the organisational strategies, structures, systems, and cultures. The framework has the following key elements:

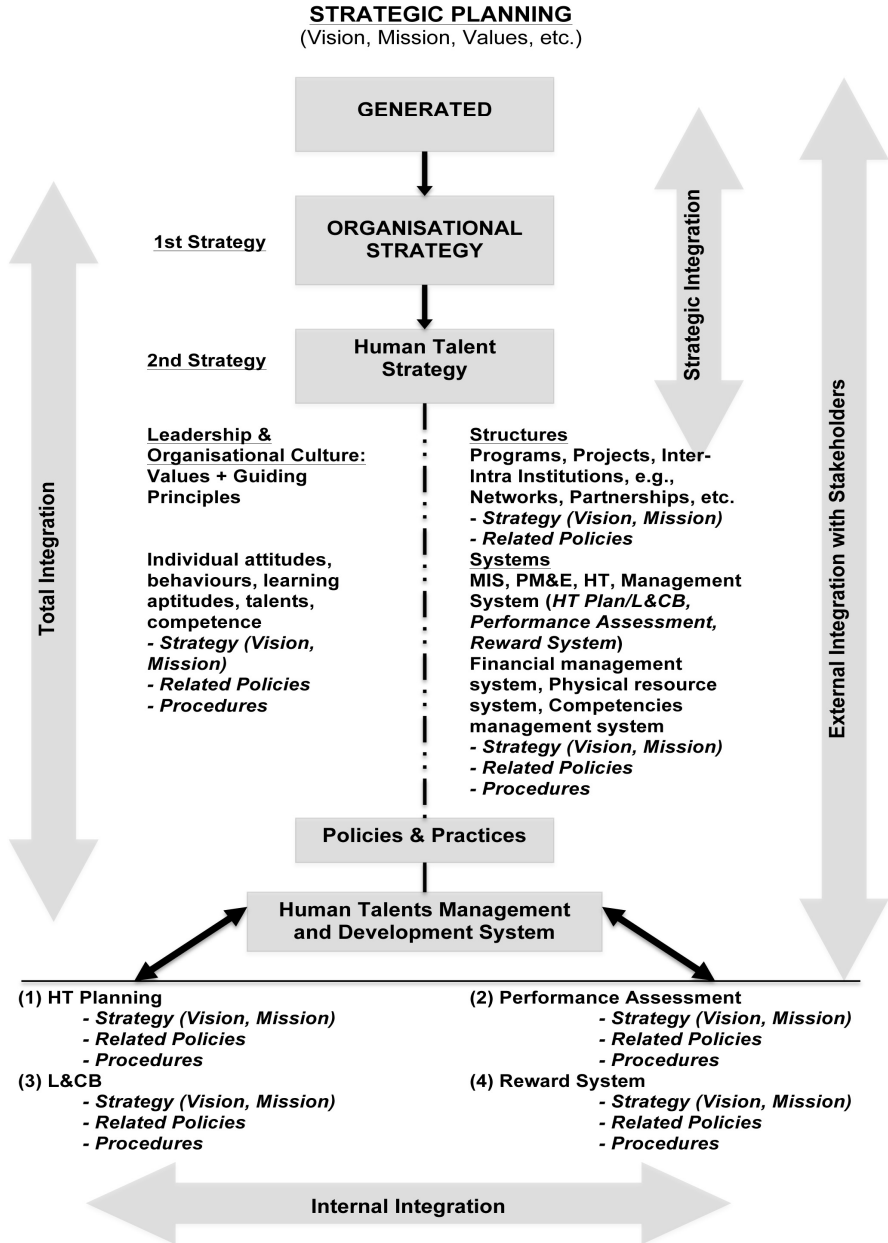
- Formulating strategies that consider human resources or human talents as strategic assets and accordingly, positioning them strategically to create competitive advantages for the organisation.
- Creating an organisational culture that promotes, nurtures, and develops human resources or human talents and aligning them towards the achievement of organisational objectives.
- Designing organisational systems and structures that enable attracting and managing all human resources or human talents available to the organisation through its architecture of relationships — within and outside the boundaries of the organisation and associated networks.

The benefits resulting from improved strategic management are:

- Everyone becomes clearer about their objectives and how they fit into the wider task of the organisation as a whole.
- It leads to more efficient use of resources.
- It is an ideal way of building commitment and motivation.
- Diverse constituencies can be brought together around a common purpose.

The NARS in PNG are committed to working with broad coalitions of actors to deliver their institutional missions. Thus SMDHT strategies needed to be formulated with active participation of these stakeholders. What this looked like in practice can be seen in case studies presented in chapter 8.

FIGURE 6.2. DEVELOPMENT OF HUMAN TALENTS FRAMEWORK (SMDHT)



Adapted by Zenete França (2010) for the PNG NARS

EARLY OUTCOMES OF ORGANISATIONAL CHANGE IN PNG NARS

At the beginning of ARDSF there were a number of generic governance and management issues in some of the NARS organisations that needed to be addressed. After four years of the capacity building process described above, the governing boards, management and staff in most of the NARS organisations — and their key stakeholders — arrived at a shared understanding of the nature and magnitude of their commitment and responsibility to deliver results to their clients and stakeholders. This outcome was achieved largely through the participatory and widely consultative strategic and program planning processes. With the shared understanding of how research for development helps facilitate and deliver impact at a people-level there is better alignment of time and resources to deliver expected results. For instance, with the creation of program director positions in NARI, the institute is now better placed to deliver medium-term results by sequencing related projects over time, and deriving synergies among related projects at a point in time.

To enhance responsiveness to diverse clients and stakeholders, the NARS have developed a geographical information system (GIS) -based tool to facilitate targeting of clients with similar attributes: biophysical conditions, socioeconomic characteristics, and proximity to markets. With the GIS tool, it is possible to visualise the spread of populations with similar attributes and, most likely, similar aspirations across the country. From this vantage point it is possible to discern appropriate innovations; and importantly, have the basis to out-scale and upscale promising innovations across the country for greater impact.

The NARS organisations have developed successful partnerships with provincial and district governments, drawing from available local development funds e.g., CIC for coffee development and rehabilitation in Enga; CCI for Cocoa in Madang; and NARI in partnership with PNG Women in Agriculture Development Foundation (PNGWiADF). The latter is based in the NARI headquarters. In return PNGWiADF assesses farmers' needs and distributes extension information. These types of partnerships illustrate the emerging demand-driven approach in NARS organisations. Through AIGS funding (see chapter 9 for details), the NARS have also built complex partnerships to facilitate different types of agricultural innovation.

The NARS organisations have developed a great collaborative spirit among

themselves. For example, realising that they were all committed to conducting socioeconomic research with relevance to policy-making, they resolved to create a NARS policy forum (see chapter 11). The objective of the forum is to create a platform for agricultural research for development organisations to engage with policy-makers and key stakeholders on topical issues on a regular basis. It is expected that through this platform the NARS organisations will influence policy-making, while accommodating policy expectations in their research for development agenda.

In collaboration with the NARS organisations, ARDSF developed a gender and HIV mainstreaming strategy (ARDSF, 2009) that was well received in the NARS and within AusAID. The strategy underscored the need to embed mainstreaming efforts into institutional policies, programs, projects and activities. In this respect, ARDSF made particular efforts to ensure that gender and HIV/AIDS issues were integrated into the emerging corporate strategic plans, medium-term program plans and specific projects and activities. ARDSF also commissioned specific projects addressing gender and HIV/AIDS.

Ongoing negotiations between the NARS organisations and the government of Papua New Guinea in the context of alignment with the Vision 2050 laid the basis for long-term funding for AR4D in PNG. Under the auspices of the Consultative Implementation Monitoring Council (CIMC), negotiations are underway seeking to transform the agricultural innovations grants scheme (AIGS) into a national agricultural innovations grants scheme (see further discussion in chapter 9). This should entrench a viable funding mechanism for funding broad-based partnerships necessary to deliver AR4D results at scale. The fact that donors such as the European Union (which is funding NARI'S AR4D agenda) and New Zealand Aid (which is continuing the process of building organisational capacity in FPDA to deliver improved services) are keen on investing in the NARS is a pointer towards future sustainability of the emerging AR4D system in PNG.

LESSONS

Long-term ongoing task. AR4D capacity building is a long-term task. It involves helping organisations develop new structures, plans and monitoring and evaluation systems that are tailored to improve delivery of services and achieving outcomes at the farm level. It is also a task that involves changing

the culture of organisations to create a shared view of their purpose and ways of working needed to achieve that purpose.

New skills and new organisational culture. The use of formal capacity building tools such as leadership courses and participatory planning processes and the use of specialised facilitators is important in helping develop new plans and structures. But is also a valuable way of making scientists and managers aware of their role in the redesigned organisation and helping them develop the new organisational culture needed to implement this new results-oriented design.

Inclusive and participatory process. The capacity building process also has a further role in generating a debate, not only within organisations but with their other partners and stakeholders. This helps address the dissatisfaction that may exist with current ways of working and achieving mandated aims. Inclusive capacity building processes offer the opportunity to air dissent and to encourage participation in new and more results-oriented plans and strategies.

Results-based capacity. The development of plans that make explicit connections between individual activities and organisational level objectives is critical, as are the M&E systems put in place to track progress and promote organisational learning.

Experimental and iterative capacity building. A related lesson is that all plans and new ways of working are inherently experimental. Capacity building processes are not about creating new normative blueprints on how organisations should work. Rather they are setting them off on a new more results-oriented way of working, where it is the responsibility of the organisation to make judgments about how effective new approaches are in the delivery of farm-level results and adapting accordingly.

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Facilitating Agricultural Research for Development in NARI

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INTRODUCTION

This chapter presents a detailed case study of the AR4D capacity building process at the National Agricultural Research Institute (NARI). This process entailed an organisational capacity needs assessment, aligning the research portfolio with results expected by diverse clients and stakeholders, aligning organisation and management systems with the results framework, building diverse partnerships, and diversifying resourcing arrangements to deliver expected results. The institute also developed a comprehensive monitoring and evaluation system to guide and account for the delivery of the expected results. Lessons from this experience include the following: (1) New plans, new structures and new M&E systems go hand-in-hand (2) An inclusive process of capacity building is needed for culture change (3) The process introduced a new program structure that was results-based, but this was still

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an experimental structure that could change in the future if it did not perform (4) Facilitation supported organisational learning (5) An organisation's own working groups have a critical role in driving the learning-by-doing process.

AR4D RECAP: AR4D AND ORGANISATIONAL DEVELOPMENT

An AR4D orientation is one that seeks to make the links between research and development outcomes explicit. As a way of framing capacity building this has implications for all aspects of the organisational development process, from planning, organisational and program structures to monitoring and evaluation. A fundamental principle of this is that all planning and implementation processes need to be explicitly linked to results. Implementation strategies not only have to be linked to results, but they must explicitly include arrangements where research activities are connected to other development organisations that need to be involved in the process in order to achieve development outcomes. Another critical aspect of capacity building framed in this way is that organisational cultures need to be reoriented towards a results-based, collaborative way of working.

INTRODUCING THE PROCESS

The ARDSF design gave little emphasis to the need for organisational capacity building in NARI. This was largely because NARI had already received 10 years of AusAID capacity building support prior to the start of ARDSF. The ARDSF design provided budgetary support (core funding) to help consolidate NARI's capacity for service delivery. The design also encouraged NARI to participate in the capacity building processes of the other PNG NARS organisations. The rationale for this was that since one of ARDSF's aims was to build the capacity of a national agricultural research system, NARI would need to be involved in that process even if this only meant strengthening links between the institute and the other NARS organisations. In this way ARDSF support created space for NARI to embark on its own organic process of capacity building while at the same time supporting the other NARS organisations in the same process.

However, the capacity needs assessment described in chapter 5 had also alerted NARI to the need to restructure its research portfolio to be better aligned with results expected by different clients and stakeholders in PNG

agriculture. This process for NARI began after the needs assessment exercise, when it reorganised its projects into a portfolio where the key organising principle was developmental results rather than research-based lines of enquiry. As the portfolio took shape, NARI found it necessary to restructure its organisation and management systems, build partnerships and diversify resourcing arrangements to deliver expected results (more details on this reorganisation and restructuring process are found later in this chapter). The institute also found that it needed to institutionalise a new monitoring and evaluation system to guide and account for delivery of the expected results. Overall, therefore, NARI found itself managing a capacity building process in response to a fundamental paradigm shift associated with its transition from a research-based to a developmental results-based way of operating. In other words this was a process of institutionalising AR4D. This, it realised, would require a facilitated, structured process of organisational learning-by-doing. This chapter provides details on how ARDSF assisted in that process.

ASSISTING THE TRANSITION TO AR4D IN NARI

As indicated in chapter 5, initial consultations with the NARI leadership and a review of key organisational plans (NARI, 2006a, b) indicated a disconnect between the large number of projects NARI was implementing and the institute's commitment in its strategic plan to impact on agricultural productivity of smallholder farmers. The first year of ARDSF support was dedicated to examining this issue and seeking resolution. After consultations between NARI and ARDSF it was decided that a good starting point would be to develop a results framework for the existing corporate plan. This involved a number of steps:

- Formulating an organisational strategic objective (described below) from the generic organisational mission
- Identifying broad-based thematic areas (described below) that would address key dimensions of the organisational strategic objective
- Identifying verifiable indicators of success (described below)

The rationale for this new framework was that organisational-level results would guide the process of determining lower level results with a view to creating an impact pathway to deliver expected outcomes and impact at the farm level. To develop this results framework NARI convened a workshop attended by its senior management, principal research scientists and ARDSF

advisors. The workshop identified the following organisational strategic objective:

Enhanced Productivity, Efficiency, Stability and Sustainability of the Smallholder Agricultural Sector

To deliver this organisational strategic objective the following six thematic results were identified⁶:

1. Effective communication within NARI and with key stakeholders in the agricultural sector
2. Policy options for sustainable agricultural development
3. Crop and livestock improvement at pilot level
4. Upscaling and out-scaling — expanded adoption and utilisation of proven innovations
5. Strengthened institutional capacity to support NARI's mandate
6. Integrated natural resource management for sustainable productivity

As consultations progressed within the organisation, it was emphasised that the results framework would be used as a management tool not only to help organise activities for impact, but also as part of a process of promoting a culture of managing for results. Some of the thematic objectives were interrelated. For example, crop and livestock improvement (theme 3) would be closely related to integrated natural resource management (theme 6). Similarly these two thematic areas would be closely related to the upscaling and out-scaling of proven innovations (theme 4). However, given the significance of each of these themes, it was decided to retain them separately to attract necessary attention and resources.

⁶ These were originally articulated as follows:

a. Information Management and Knowledge Sharing: Enhanced effectiveness in information management and knowledge sharing in agricultural R4D

b. Influencing Enabling Environments: Enabling environment (policy, markets, institutions) for sustainable agricultural development

c. Crop and Livestock Improvement: Enhanced crop and livestock productivity, efficiency and stability of smallholder farmers in pilot areas

d. Integrated Natural Resource Management: Improved agro-ecosystem resilience, (potential) resource productivity, and agro-environmental services in pilot areas

e. Out-scaling and Upscaling of successful innovations: Enhanced out-scaling and upscaling of successful innovations

f. Institutional Management and Development: Enhanced efficiency, effectiveness and congenial institutional environment for effective agricultural R&D service delivery

This formed the basis of a draft corporate results framework (NARI, 2008b). Even though NARI was in the process of re-orienting its organisational strategy, the institute already had a large portfolio of projects to manage. NARI then tried to align those projects with relevant thematic areas. The purpose of this retrofitting exercise was to see if existing projects were relevant to achieving thematic objectives and whether they were sufficient, or if other projects would be needed. The exercise found that existing projects were likely to partially achieve results planned in some thematic areas but it also found that some thematic areas had very few contributing projects. Perhaps, not surprisingly, given the historical development of NARI, the themes with the most relevant projects were those relating to technology generation and those with the least were themes on upscaling, out-scaling and policy issues.

The results of this exercise demonstrated that no matter how hard NARI continued to work on existing or even additional similar projects, it would still not achieve its organisational mission. This alerted NARI to the need to review both its research portfolio and the way it was organised to deliver it. This realisation by NARI was instrumental in its adoption of an AR4D orientation and, with it, the desire to promote a culture of managing for results in the institute. There was, however, recognition that this would take time and effort to fully re-orient the organisation in this direction.

An initial step was the need to restructure research project portfolios towards a research for development agenda. However, successful implementation would also involve the alignment of NARI's organisation and management processes to deliver that agenda, and development of an appropriate strategy to resource that agenda. In line with an AR4D orientation it was also recognised that this process would require continuous learning by doing, and that this was a skill that NARI needed to learn and institutionalise. This idea was endorsed by the NARI Council at that point of time.

IMPLEMENTING THE RESTRUCTURING AND BUILDING LEARNING-BY-DOING SKILLS

To initiate the implementation of the new approach, NARI began by reviewing its organisation and management structures in order to identify ways in which these could be aligned with the results framework. In doing so NARI appreciated that in developing a results framework, it had built a bridge between scientific activities and developmental outcomes. It was

anticipated that the M&E framework that NARI was developing would be useful in tracking milestones along the impact chain that connected research to developmental outcomes. This, in turn, made explicit the need to have clear roles and responsibilities for reaching these milestones as well as the necessary resource allocation for this.

NARI defined these roles and responsibilities as follows:

- a)** The existing but vacant position of Deputy Director General (DDG) was redefined as a role of coordinating and supervising thematic leaders. The DDG would report to the Director General (DG).
- b)** Six thematic leader positions were created; their prime responsibility would be to ensure that thematic objectives were achieved. The vision of these positions was that thematic leaders would develop synergy among related projects and track their effectiveness in addressing short, medium and long-term thematic objectives that, in turn, would contribute to the achievement of NARI's organisational strategic objective (mission). The thematic leaders would supervise project leaders.
- c)** The six thematic leaders would form a Research and Development Committee (RDC) to facilitate synergies across the thematic areas. This was seen as a way of ensuring that themes collectively linked to the organisational strategic objective. The committee would be chaired by the DDG.
- d)** Research program leader positions were converted into regional centre directors to serve as flagships for NARI in each region. Part of the plan here was to ensure effective resource utilisation in each centre and provide administrative backstopping for all thematic teams based in each centre⁷.
- e)** Project leaders were given the responsibility of reporting (results) to the thematic leaders through regional program directors responsible for the centres in which they were situated. They would report administratively to the same regional program directors⁸.
- f)** Activity leaders would report (results) to the relevant project leaders. To ensure a smooth transition current research program leaders would continue to supervise implementation and reporting of ongoing projects.

⁷ For historical reasons NARI has dispersed locations and research program leaders were the administrative and scientific heads of the various research stations (= agro-ecological programs, hence program leaders).

⁸ Project leaders report on technical matters to the program (thematic) leaders and only on administrative matters to the RDC.

However, new thematic leaders would initiate planning for new projects. It was expected that the new structure would become operational by the middle of the following year (2009).

The annual implementation plan (AIP) for 2008 marked the turning point in NARI's commitment to managing for results. The plan was deliberately aligned to the organisational results framework and the management committed to making progress reports against a related M&E framework (NARI, 2008a). This made thematic leaders, later renamed program directors, responsible for managing for results and reporting accordingly. The AIP was designed so that annual activities would be reported against expected project outputs and outcomes. Annual reports consolidated overall program results to report against expected organisational outcomes and impact.

CAPACITY DEVELOPMENT FOR RESULTS-BASED MANAGEMENT

Launching thematic leadership in NARI was quite challenging. An initial attempt to have thematic leaders play their new roles — while still doing all previous duties — turned out to be ineffective. Subsequently, despite several advertisements for staff to fill these new positions, no suitable candidates could be found in the local market. Meanwhile NARI scientists continued to develop project proposals that, despite not being aligned with the new thematic objectives, were administratively approved. Further, given that the emerging thematic leaders were not familiar with program planning and management approaches, it was agreed that they would be exposed to relevant training, including leadership skills to effectively handle their new responsibilities.

To this end it was agreed that ARDSF would conduct a Program Planning course for thematic leaders. However, ARDSF soon realised that this would need to be preceded by a learning needs assessment (LNA) (Franca and Sibanda, 2008). This was targeted at identified factors affecting NARI's organisational capacity at different levels of operation — senior management, program management, regional centre management and project management in relation to managing for results. Identified factors included: technical and managerial knowledge, attitudes, and skills of the participants; and organisational constraints. One of the key recommendations of the assessment was the need for job descriptions at different levels of operation: program leaders, regional centre managers, and project leaders. The results of the

LNA provided the basis for subsequent development of a proposal to NARI's council to realign its structure.

Shortly afterwards ARDSF conducted a Program Planning course. This provided participants with the opportunity to strengthen capacity in the area of results-oriented program formulation within the broader framework of AR4D. The course also provided participants with theoretical and practical knowledge on the entire program planning and management cycle. This included:

- How to undertake sector reviews
- How to engage clients and stakeholders in the program formulation processes
- How to analyse constraints and opportunities to establish cause and effect relationships at the thematic level
- How to formulate program objectives and strategies
- How to identify and prioritise projects
- How to institutionalise results-based program management

The course emphasised the need to link program planning with strategic planning; and the need to integrate monitoring and evaluation with impact assessment to ensure effective delivery of short-term and medium-term results.

A key lesson emerging from the program planning course was the need to have different types of projects sequentially linked over time and space to deliver medium and long-term results. Up to this point projects had been designed and delivered in isolation, and, as a result, were delivering disconnected short-term results.

It also became clear that in thinking of different types of projects, there was a need to consider different types of research: strategic (addressing generic issues that are potentially useful in different production systems) and adaptive (applying generic solutions to specific production systems). However, it was appreciated that the two thrusts of work would require different types of organisational arrangements. Strategic thrusts were best implemented through nationally coordinated initiatives.

Given their level of abstraction, they could also be sub-contracted outside the country. This, in turn, could lay the basis for strategic partnerships with

advanced research organisations — private or public. Adaptive thrusts were best implemented through regionally coordinated initiatives. However, even when differentiated that way, the need to harmonise the different types of research — so that they could inform and synergise each other — still needed to be given adequate emphasis. For that reason, program directors (previously called thematic leaders) needed to be held responsible for harmonising different research thrusts to derive necessary synergies to deliver developmental results.

On this basis NARI decided to develop a strategy document for each of the themes, encompassing sub-themes and leading towards identification of holistic project portfolios. While waiting for the appointment of the program directors, NARI created a Strategic Planning Task Force (SPTF) to spearhead the program development process. The SPTF was composed of members from the senior management (a program director, a research coordinator, an M&E officer, a GIS specialist and a socio-economist), with one member appointed as the leader of the task force to report to the CEO on progress.

THE NARI STRATEGIC PLANNING TASK FORCE

The inaugural meeting of the strategic planning task force was controversial but fruitful. There was general consensus that the new entry point to program development would be GIS-based development domains. However, there was a lingering view that the traditional commodity or factor-based research approach was serving NARI well and should be retained.

Development domains represented target groups sharing the same agro-ecological conditions/agricultural potential, proximity to the market and socioeconomic status. On this basis it was argued that they would be expected to have similar interests and aspirations. Focus on the development domains, therefore, would be demand-driven and people-centred. In most instances, this would inevitably require research projects with broad-based approaches, requiring diverse partnerships with other organisations. The commodity or factor-based approach, on the other hand, was research discipline-driven. In effect this latter approach articulated NARI's core scientific competencies leading to what the institute could deliver alone.

This tension represented a major dilemma and decision point for NARI — should the institute continue delivering only what it could, even if it resulted

in limited impact among clients and stakeholders? Or should NARI change its approach to address the broader research for development objectives and embrace a partnership approach? The task force chose the latter and accepted that it would have to use the program development process to re-orient the entire organisation to this new way of doing business.

To allow effective learning-by-doing, the taskforce decided to first develop a program out of the thematic area ‘Crop and Livestock Improvement’, as it was considered to represent the core business of the organisation. Other thematic areas would be addressed as the approach became clearer. The process of developing this thematic area involved the following steps: defining agricultural development domains; identifying constraints and opportunities in the respective agricultural development domains in relation to the strategic objective of the chosen program; and formulating project areas (reflecting dimensions of the strategic objective of the chosen program or thematic area).

What was critical was the recognition that the objectives of a thematic area would need to be broad enough to accommodate different disciplinary perspectives. For example, in the case of commercialisation of a priority commodity, key elements would include crop development, soil fertility, water management, production economics, producer organisations, etc. Competing projects would need to be prioritised based on their expected socioeconomic gains to ensure that resources were allocated to projects that had the promise to deliver the most impact.

As the task force proceeded in the program development process, availability of data became a key constraint. Given limited time and resources, the task force decided to use working groups of NARI scientists as expert panels to interpret and make informed judgments based on available data. Given the data constraints the task force decided to use more broadly defined and hence fewer agricultural development domains. This was found to be a viable way of generating an adequate level of constraint and opportunity analysis to tackle a sufficiently wide range of issues that inform portfolio development. However, learning from the situation the task force committed to begin filling data gaps for future planning processes. The NARI GIS specialist was tasked with leading this activity.

As the task force became increasingly familiar with the development domains, tension began to build against the previous insights gained in the development of the organisational results framework. An ensuing debate clarified that the

results framework had only specified organisational commitments: strategic objective and thematic results. Development domains, on the other hand, were now providing the context within which to deliver the expected results. As the analysis continued, it became clear that for such results to be delivered there was a need for synergistic inputs from all the thematic area results. With this insight, the task force decided to develop all thematic areas simultaneously.

With the broadened approach, it became possible to address all constraints and opportunities relating to a particular development domain. It is worth highlighting the difference between development domains and the thematic areas and the programs these defined. The development domain was a way of grouping similar development conditions and highlighting constraints and opportunity analyses in these groupings. The programs were a way of giving focus to a portfolio of projects addressing certain sorts of development outcomes in the development domains. Understandably, a number of different programs would need to work together to address the cluster of development outcomes needed in each domain. Thus, the emerging programs covered a whole spectrum of issues ranging from production to consumption; and from pilots to out-scaling and upscaling. In covering this range of issues, it was also possible to harness from different types of research — basic, applied, adaptive and uptake pathways⁹.

It is also worth noting at this point that NARI could well have decided to use the development domains as a way of organising its program and project structure. It could, after all, be argued that this defined what needed to be done in a more holistic way. Research could have then been organised around that. The trouble with these debates is that they can be argued both ways by skilful advocates. The take home message here is that NARI made a choice based on information available and arrived at a consensus. The approach chosen was inherently experimental and subject to revision if it was found not to be working in the future.

Another issue that arose as the task force worked to reconcile top-down planning of the organisational results framework with bottom-up approaches addressing development domains was the challenge of multilayered levels of results — a hierarchy of objectives at different operational levels. To address

⁹ Basic research seeks to explore the unknown and add to the pool of knowledge; applied research uses available knowledge to develop generic solutions to known constraints; adaptive research uses generic solutions to solve specific problems; uptake pathways offer institutional mechanisms to facilitate out-scaling and upscaling of innovations.

the issue, the task force resolved to use cascading logic to differentiate each unit of analysis.

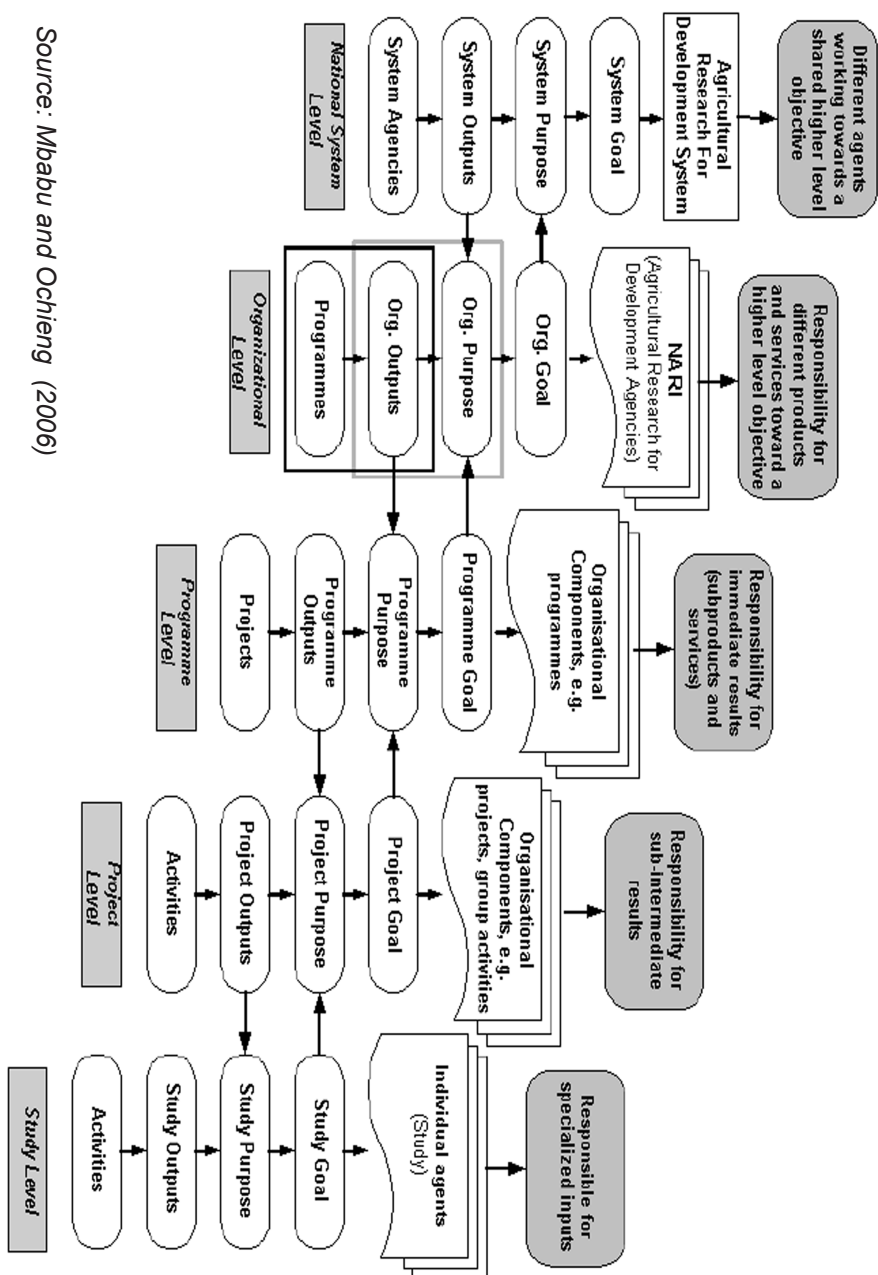
This cascading logic needs some explanation, as the terminology can be initially confusing. The essence of it is that projects, programs and the organisational strategy all have separate but linked logframes. Each of these logframes sets out goals, purposes (termed here as the strategic objective) and outputs. These logframes are not organised in parallel, where they all share the same goal. Instead they are organised as a hierarchy where the purpose (the strategic objective) at the organisational strategy level becomes the goal at the program level and the purpose at the program level becomes the project level goal.

ARDSF and NARI describe this as a hierarchy of objectives (actually purposes) because in any given logframe the goal would be considered as the objective (purpose) of the logframe above it in the hierarchy. If all these objectives (purposes) in this hierarchy of logframes are achieved in NARI, the organisation contributes to its goal, which is the purpose in the hypothetical national level logframe. Figure 7.1 illustrates this cascading logic. It needs to be noted that in this cascading logic, logframes link goal to purpose on the way up the hierarchy, but purpose to goal on the way down the hierarchy.

Initial findings of the task force's efforts in developing the new programs were reported in a stakeholder workshop (NARI, 2010a). Participants included the newly appointed program directors, senior scientists from all NARI centres, and representatives from other NARS organisations. Participants appreciated the effort the task force had made in mapping out different development domains and identifying deliverables (outputs) for each domain, made up of the deliverables from each of the contributing program's deliverables. However, the task force was encouraged to further clarify how the expected deliverables responded to the aspirations of specific clients in each of the development domains.

To address this issue, the task force used agricultural development domains it had already characterised, available socioeconomic data and group discussions to identify biophysical, socioeconomic, cultural, market, and environmental constraints and opportunities. This was done using a facilitated workshop approach, with a range of stakeholders contributing to the process. Out of this analysis they generated domain-specific objectives that constituted sub-program objectives. These sub-program objectives, in turn, generated project

FIGURE 7.1. CASCADING LOGIC FOR NARI



Source: Mbabu and Ochieng (2006)

areas that were prioritised and selected for future implementation through different programs and various funding mechanisms. In effect, therefore, NARI had finally managed to link organisational strategic planning with the more micro-level impact-oriented project portfolio via thematic programmatic frameworks (NARI, 2010b). Figure 7.2 presents NARI's results framework and illustrates how these different elements link to each other. With this vertical linkage completed, NARI was now at a position to develop a monitoring and evaluation system that would account for all operational levels.

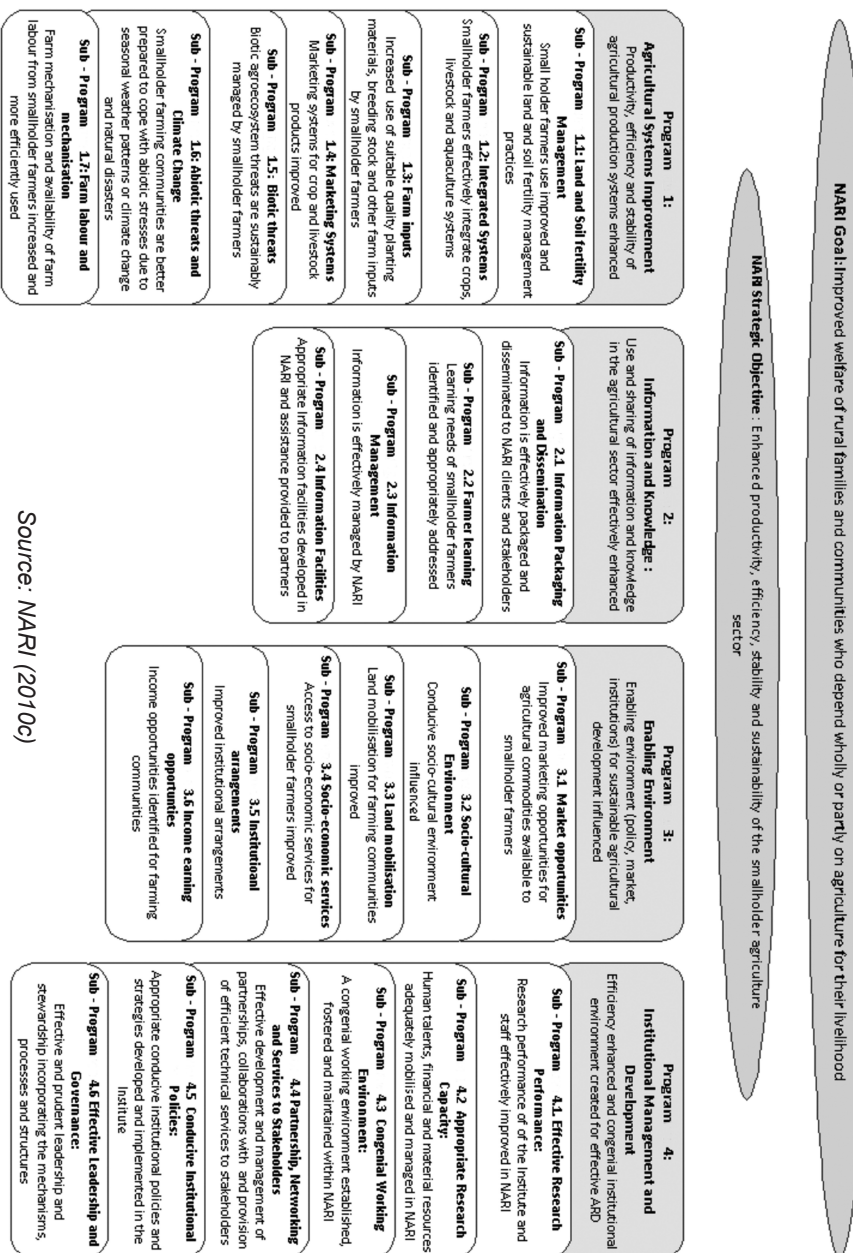
Lessons learned from the program formulation process were evident in NARI's annual implementation plan (NARI, 2010c). For the first time NARI had mainstreamed out-scaling and upscaling activities into its portfolio. In seeking to improve the livelihoods of communities in specific development domains, it had become clear that the institute needed to commit itself beyond the traditional piloting activities. Indeed, expected outcomes and impact were inevitably intertwined with out-scaling and upscaling initiatives.

The other lesson learned in working with specific development domains was the need to mainstream natural resource management in all commodity research efforts. It was understood that anything less would only deliver unsustainable productivity gains. An equally significant lesson learned was the need to approach livestock and crop production in an integrated manner; particularly in the smallholder agricultural production systems that dominated most of the priority development domains.

Finally, the 2010 annual implementation plan (NARI, 2010c) underscored the need to mainstream monitoring and evaluation, including impact assessment, in all operational levels — organisation, program and project. As a consequence of this, former crops, livestock, natural resource management and upscaling thematic areas were integrated into one Agricultural Systems Improvement Program under one director.

NARI also noted that while it managed as many as 48 projects at the time with many projects due for completion in 2010, the institute could still not expect to achieve expected program outputs and outcomes (indicating that purposes had been achieved). This was mainly because the pre-existing project portfolio was not designed with those results in mind. In most cases, projects were designed independently, even those with related objectives. Thus, most of the completed projects would require follow-up initiatives to deliver medium and long-term development objectives. To facilitate this

FIGURE 7.2. NARI CORPORATE RESULTS FRAMEWORK



Source: NARI (2010c)

results-oriented approach, the institute adopted a research for development cycle. This involved a shift from generic research findings to developing and piloting appropriate solutions to given challenges and opportunities; ensuring widespread utilisation of specific innovations to neighbouring communities (out-scaling) and to larger areas (upscaling). It was recognised that this research for development cycle would require monitoring arrangements to ensure effective learning-by-doing, and impact assessments to affirm achievement of expected outcomes. The development of this M&E system is dealt with in more detail in chapter 10.

Post-Script on Outcomes of this Process

As a result of this transformation, NARI has attracted major support from international competitive grants and other non-traditional funders. The institute has also received funding to collaborate with neighbouring countries in capacity building activities.

LESSONS

New plans, new structures and new M&E. The adoption of AR4D as a way of reorienting agricultural research requires fundamental changes in the way agricultural research is organised and executed. It involves a shift from research-based organisations to research for development organisations. The changes involved are neither trivial nor cosmetic. Instead they require new strategic plans; new program structures to regroup projects, new ways of prioritising and linking research projects and new ways of monitoring and evaluating progress.

Inclusive process for culture change. This process is time-consuming and needs to be conducted in as inclusive a manner as possible. This helps ensure that the shift to a managing-for-results approach becomes embedded and owned by all levels of the organisation and becomes part of its culture.

Results-based, but experimental structures. The development of a program and project structure that best helps the organisation achieve its strategic objectives needs to be driven by the nature of those objectives. The idea of agricultural research for development helps define that objective. However, in any organisation there will be competing views on which structures best serve the organisation's strategic objectives. It needs to be remembered that

new structures are always going to be experimental and open to the scrutiny of monitoring and evaluation. In this way organisations can learn their way into structures that best fit their purpose.

Facilitated by driven by learning. External facilitation is a valuable way of supporting organisational learning. However, an organisation's own working groups have a critical role in driving the learning-by-doing process. Equally important is the strong leadership of an organisation and with it a commitment to deliver support and service to smallholder farmers.

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Empowering the Human Side of the Organisation to Lead the AR4D Approach

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INTRODUCTION

This chapter provides an overview of the capacity-building and human talents management and development activities carried out under ARDSF, explaining the approach to learning which guided the whole program, identifying the methodologies used and presenting the main results achieved as well as some of the obstacles encountered. An important shift of emphasis from capacity building to human talents management and development took place during this period, and the main emphasis in this chapter will, therefore, be on the activities concerned with the strategic management and development of human talents.

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⁶ Previously Technical Director ARDSF and Senior Advisor of Agriculture Development in Aus-AID, based in Papua New Guinea. Currently Project Manager of Reaching Agents of Change, International Potato Centre (CIP), Nairobi.

THE ROLE OF HUMAN TALENTS IN AR4D

Talents are aptitudes that human beings are born with. These talents are affected by the environment. If this environment is supportive, talents are strengthened; if unsupportive, they are weakened. The aim of the organisation in AR4D, is therefore, to provide a supportive environment to nurture and strengthen the staff's talents to achieve effective performance. The term 'human talents' reflects the importance of the contribution of human beings to organisations. By seeing human talents as a necessary resource, the organisation strengthens itself by hiring and developing talented people and synergising their contributions within its range of existing resources. A human talents management and development system provides the basis for sustained effective individual, team and organisational performance.

Innovation systems perspectives and an AR4D orientation demand new types of human inputs, including creativity, vision and interaction. This in turn calls for the development of new competencies and positive attitudes — new talents — to ensure that organisational sub-systems are effectively interconnected, that the political, economic, social, and cultural contexts are taken into account, that the organisations and a range of different actors are involved in the institutional processes and that patterns and intensity of interactions among different agents are identified and nurtured. This approach also requires that the process, or way of doing things, is results-led. In the case of AR4D investments, the results, outcomes and impact mean tangible improvements in the wellbeing of smallholder farmers and their households.

The AR4D approach thus emphasises the human side of organisations and the development of innovation capacity in its widest sense. This means that individuals must be enabled to create and drive the necessary actions with the assurance that they are valued and empowered inside and outside the organisation and are seen and treated as its most important asset. In other words, individuals in organisations need to be treated as 'human talents' instead of 'human resources'.

This new perspective helps staff in an organisation appreciate that they are more important than the organisation's other resources. It helps staff to consciously develop capabilities to deploy resources and apply organisational processes that are specific and developed over time through complex interactions. Unlike resources, capabilities are based on developing, carrying and exchanging information among and between the organisation's human talents.

TOWARDS A HUMAN TALENTS DEVELOPMENT PROGRAM FOR THE PNG NARS

ARDSF contributed to the development of human talents in the PNG NARS from the outset through an extensive series of workshops starting in 2007 and continuing up to the end of the project in mid-2012.

Based on the ARDSF implementation plan, one group of workshops in the series was concerned with strategic planning, research-oriented program formulation (accompanied by assessments of the learning needs and organisational constraints, or LNAs, in the various organisations), project planning, and monitoring and evaluation.

The goal of the LNAs was to identify gaps in knowledge, attitudes and skills, which could affect the capacity of NARS senior managers to fully embrace an AR4D orientation. Participants in these events were invited to reflect on the managerial and technical knowledge and the attitudes and skills that the thematic area or program leaders would require, which were different from those required of project leader positions of the past.

These LNA events provided the basis for the design of effective learning and capacity-building (L&CB) programs that would respond to the real needs of program and project leaders in the participating organisations. These L&CB programs, comprising the first group of workshops referred to above, aimed to empower NARS managerial staff to develop strategic plans, formulate programs and projects for their organisations and to be able to continue to do so after the end of ARDSF.

This first group of workshops brought together program level managers and senior officers and mentored them to lead the strategic planning and program formulation processes in a reflective, iterative and participatory action-learning mode with stakeholders. As a result, participants were able to engage in these processes with confidence and to change their own mindsets in order to change the focus of their organisations — from merely producing research results to the more meaningful objective of doing research for development in order to change the lives of smallholders in PNG.

In the course of these events, the NARS senior managers identified key thematic areas or programs and their objectives, indicators and strategies and formulated statements regarding the visions, missions, core values, goals and

purposes of their organisations to be incorporated in their strategic plans.

Two important results came out from these events. The first was that the NARS senior management began to recognise the new role of thematic or program leaders and the critical importance of this position in the light of the cascading logic of the strategic plans (see Chapter 10). The second result was that the thematic area, ‘Institutional Capacity Strengthening’, was identified as being important to all the NARS, and the area that would depend most heavily on the management and development of human talents. Institutional Capacity Strengthening thus became Program Six of the organisational strategy in all the NARS.

The emphasis at this stage was thus on capacity building rather than the management and development of human talents as such.

During the course of the first series of workshops, it became apparent that there was a need to introduce a stronger approach to manage and develop the human talents of the NARS in more fundamental ways. For example, the participants in one workshop expressed a common concern that steps should be taken to ensure that the results of their strategic planning and program formulation efforts were implemented by their organisation. These steps needed to include human talents planning to link the staff’s competencies and attitudes, their performance assessment and rewards and learning and capacity building to the requirements of programs, projects and project activities in line with the organisational strategic objectives.

As a result, a second series of workshops was organised in 2010 with the aim of developing new competencies and positive attitudes related to creating a robust human talents management and development system. At the same time, in order to ensure that practical achievements in these areas were realised before the end of ARDSF, efforts gradually came to be focused primarily on the Cocoa and Coconut Institute Limited (CCI) and the Coffee Industry Corporation (CIC), with some involvement by the Fresh Produce Development Agency (FPDA) — these being the NARS organisations that had been most actively involved in the earlier capacity building activities.

As noted above, this chapter will focus mainly on this second series of workshops and their results in order to emphasise the vital importance of human talents to the successful and continuing application of the AR4D approach in the PNG NARS.

A CONCEPTUAL FRAMEWORK FOR HUMAN TALENTS DEVELOPMENT

To prepare the way for the development of human talents strategies in the NARS, in June 2010 ARDSF produced a document, 'A Conceptual Framework for the Strategic Management and Development of Human Talents: General Guideline for Mentoring NARS in Papua New Guinea', adapted from an International Service for National Agricultural Research (ISNAR)⁷ Learning Module for Distance Learning (Franca, 2010). This was designed to mentor the NARS in their efforts to build their capacity to manage and develop human talents and to translate them into innovative processes, products, and services. The guideline built on the foundations laid by a learning program of ISNAR/IFPRI and on the results of an extensive literature review carried out by ISNAR. It introduces the Strategic Management and Development of Human Talents (SMDHT) framework⁸ (see figure 8.1) and its components, along with suggestions on guiding concepts that emerge as foundations, tools, approaches and methodologies that help to increase understanding and strengthen knowledge on issues related to the framework. The guideline was delivered to the management of all six NARS organisations on CD-ROM and in hard copy.

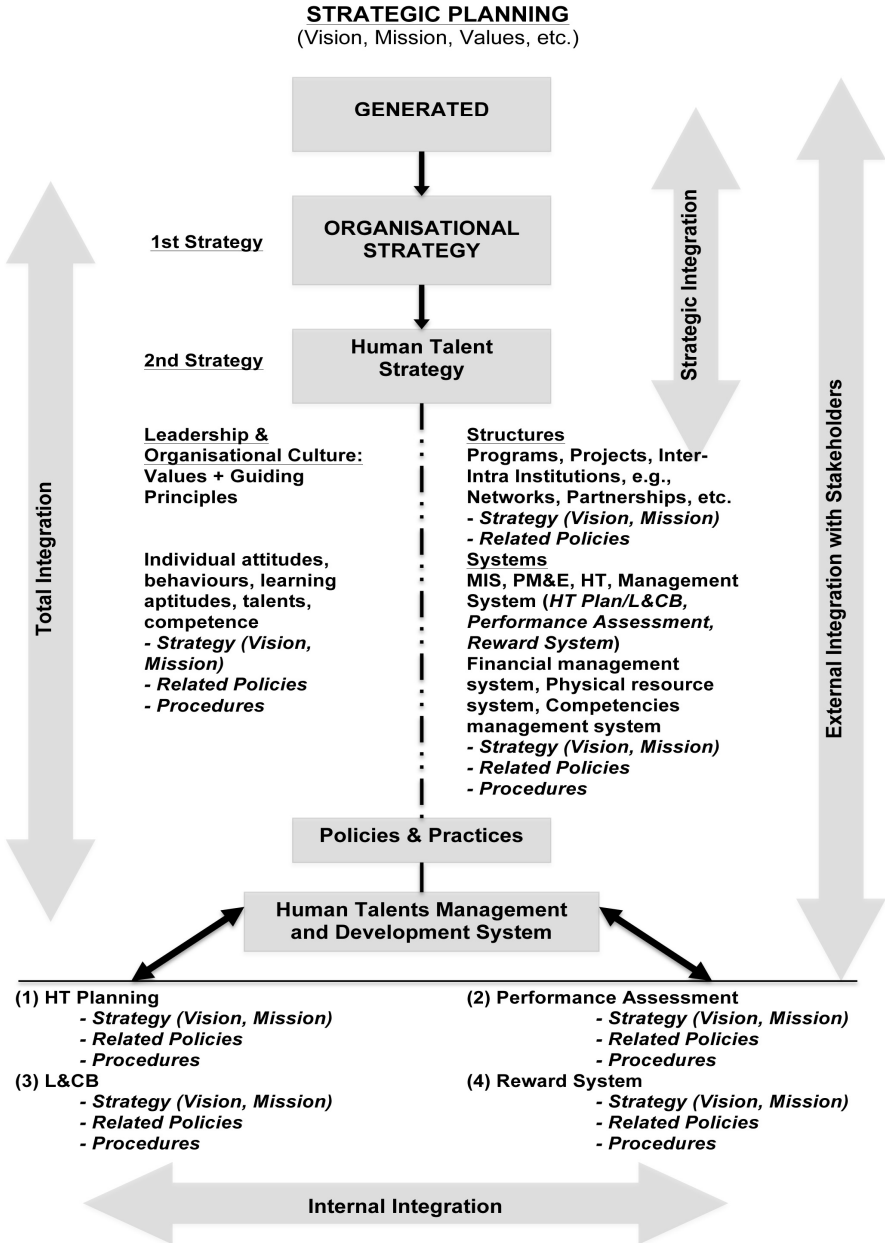
A workshop on Strategic Management and Development of Human Talents, developed in conjunction with CCI, CIC and FPDA, was presented separately for each organisation between June and September 2010. These workshops introduced the SMDHT framework (Figure 8.1).

A human talents management system or framework to support the AR4D approach needs to adopt a systemic thinking approach, be robust but non-prescriptive and demonstrate a competence-based view that sees human talents as vital assets within the organisation. It should rely on the logical framework that enables the strategic integration required to align human talents with organisational goals. It should promote an integrated approach to performance management, support integrated performance assessment, performance rewards and learning and capacity building and adopt the

⁷ Later brought under the International Food Policy Research Institute (IFPRI).

⁸ This framework was adapted by V. Galleno in 2001 from the framework for strategic integration for SMDHT of the Open University (UK), (Course B824, Unit 2, p. 31) to guide an ISNAR/IFPRI distance learning program, and was further developed by Franca (2010) to support the ARDSF Institutional Development Component to empower the PNG NARS organisations.

FIGURE 8.1. DEVELOPMENT OF HUMAN TALENTS FRAMEWORK (SMDHT)



Adapted by Zenete França (2010) for the PNG NARS

guiding principles of the learning organisation to promote the development of organisational culture.

The SMDHT framework introduced in these workshops embodies these characteristics. It supports the formulation and implementation of human talents strategies designed to organise, manage and develop human talents to lead the implementation of programs, projects and project activities, as well as activities to support the management of four key organisational areas: Strategy, Systems, Structures and Culture. It emphasises the development and application of cognitive processes, such as formulating strategies and organisational objectives as well as the affective processes involving emotions. It inspires people to follow a vision, be creative, etc., which leaders and managers in all organisations need in order to be efficient and effective.

The successful implementation of the SMDHT Framework requires four kinds of Integration to make sure that it is systemic so as to bring about the expected results:

- Total integration: Coherence among the organisational strategies, structures, systems and culture
- External integration: Linkages between and among different organisations, involving other actors that contribute to agricultural innovations
- Strategic integration: Alignment between the organisation's strategic objectives and its human talents in order to achieve effective performance
- Internal integration: Coherence among the four components of a Human Talents Management and Development System, namely: human talents planning; performance assessment; performance rewards; and learning and capacity building

The aim of these human talents workshops was to guide the participating NARS organisations on how to prepare the staff to plan, design and implement program and project objectives through project activities and to support the implementation of activities related to the four pillars of the organisation — namely, Strategies, Structures, Systems and Culture — in line with the results of their strategic planning, identification of thematic areas and priority objectives. This was intended to ensure that the NARS would continue aligning the whole organisation to give it a common, unifying sense of purpose and performance, focusing on the AR4D framework.

These workshops concentrated on the design of a draft Human Talents Strategy for each of the participating organisations. The participants reflected on issues related to the management and development of a human talents management and development system in order to come up with a rationale, vision, mission, goal and purpose for the Human Talents Strategy for their respective organisations.

The aim of these strategies was to support the implementation of the Human Talents Management and Development Systems of the organisations. They were to be shared and discussed with the entire personnel of the organisations in order to receive comments and suggestions for improvement. After incorporating such contributions, and being approved by each organisation's management team, the intention was for the completed Human Talents Strategy to be communicated to the entire staff through seminars, meetings, bulletins or newsletters, etc. However, the Human Talents Strategy was meant to be seen as a living document, to be revisited from time-to-time to review, revise and change elements as necessary.

IMPLEMENTING HUMAN TALENTS STRATEGIES IN THE PNG NARS

In 2011, in response to a request from stakeholders, ARDSF included in its program support for the implementation of the Human Talents Strategies of CCI and CIC, involving other NARS as much as possible. ARDSF intended for this to serve as an example to be followed by the other NARS organisations after the end of ARDSF, adapted as necessary to their own situations.

However, for ARDSF to assist CCI and CIC in implementing the SMDHT, the organisations' program, project and project activities plans and their respective logical frameworks needed to be completed beforehand. These plans were prerequisites for the integration of the planning system with the Human Talents Management and Development System.

Due to time constraints, ARDSF agreed with CCI and CIC on the completion of documentation of one program, one related priority project and one associated project activity in order to subsequently integrate the planning process with Human Talents Planning. Both organisations chose to work on their respective productivity improvement programs, from which they each selected one priority project and one related project activity to make sure

that these steps responded to the requirements of the cascading logic and matched with the long-term development-oriented strategic objectives of the two organisations.

This activity was carried out by productivity improvement teams from CCI and CIC, with support from ARDSF consultants, in a Workshop on Program and Project Documentation held from October 17 to November 4, 2011 in Port Moresby, Kokopo and Goroka. The teams developed draft program, project and project activity plans for their productivity improvement programs, which were further refined in events held in Port Moresby from November 14–25, 2011. The aim of these events was to review the draft program, project and project activity plans of the two organisations and to ensure their integration with the Human Talents Strategy.

The program, project and project activity plans and the logical framework were the key documents used to identify the required competencies and attitudes and performance indicators. Participants from each organisation undertook job analysis at each level of the cascading logic using the logical framework. They identified the required competencies (managerial and technical knowledge), attitudes and performance assessment indicators, which were used to build job descriptions for the program, project and project activity leaders and project activity team members who would be internally recruited to work on selected projects. These job descriptions, which responded to the requirements of the cascading logic, have aligned the organisation's human talents with its long-term development-oriented strategic objectives and will be used by each NARS organisation in its recruitment and selection processes in the future, and in its redeployment of staff to more suitable positions.

In addition, workshop participants reflected on organisational values and guiding principles identified during the strategic planning process and their use as a basis for identifying indicators for performance assessment. They stressed that the values and guiding principles of the organisation must be taken into account during the performance assessment process to ensure the development of the organisational culture. This link between organisational values and guiding principles, on the one hand, and performance assessment, on the other, reinforces the strategic integration between human talents strategy and strategic plans.

To illustrate this process, one of the values identified by the CCI strategic plan was *accountability*. The participants undertook an exercise to

translate accountability into observable behaviours and indicators to verify accountability as follows:

CCI Value: Accountability

Observable behaviours:

1. Responsible for results
2. Follows correct procedures/compliance with requirements
3. Transparency

Indicators to verify behaviour:

1. Meets deadlines and adheres to schedules/plans
2. Accepts responsibility for actions
3. Is responsible for results, good or bad

This exercise emphasised the importance of translating the organisation's values into workable information to avoid misinterpretation of observable behaviour as well as related indicators. Such exercises should always be undertaken by staff and supervisors when identifying performance indicators related to attitudes in the performance assessment plan.

To ensure continuity in the effective implementation of activities related to their human talents management and development systems, both CCI and CIC appointed senior staff members as human talents officers. These officers, and the FPDA human talents officer already in place, became closely involved in the remaining human talents activities carried out under ARDSF.

In December 2011, ARDSF undertook two important actions to guide the entire staff of CCI and CIC on the implementation of the Strategic Management and Development of Human Talents.

The first was to invite the human talents officers of CCI, CIC and FPDA to develop a strong team to work together to implement actions and exchange competencies between the organisations. ARDSF saw this as a way to maximise and speed up the implementation of the Human Talents Strategies of CCI and CIC.

The second action was to bring together the human talents teams (including the human talents officers and the ARDSF consultant) of CCI and CIC to meet the entire staff of their organisations in order to share and analyse the impact of the implementation of AR4D in relation to the Human Talents Management and Development System. In each case, the team first held a

seminar with the entire staff, and subsequently met with them in small groups representing all departments of the organisation. The teams received feedback on the implementation of the new human talents planning approach, through which job analysis — using the logical framework — had been employed to develop job descriptions, recruitment and selection processes which could be used to re-deploy the entire staff of the organisations. They also introduced the Human Talents Management and Development System as a whole.

The results of these meetings in both CCI and CIC were very positive. In general, the staff anticipated that there would have to be changes in ways of doing things in their organisations, which they felt would be very constructive and motivating. The new perspective that was presented, which values the creative human being, was welcomed. The staff felt that the new recruitment and selection approach would contribute not only to increasing staff motivation and self-esteem, but also to increasing trust and confidence in the management and leadership of the organisations.

At the end of these awareness raising meetings, the staff of both organisations were advised that in the following months ARDSF would provide coaching to the CCI and CIC human talents officers and other senior officers to help them to revise existing strategies, policies and procedures related to human talents and management activities and to develop new ones — as happened in both organisations.

It is important to emphasise that the CEOs of CCI and CIC both supported this process of change and considered it to be the only way the organisations could be prepared to attain the strategic objectives that were presented to stakeholders and actors of related industries in PNG in their strategic plans.

NEW STRATEGIES, POLICIES AND PROCEDURES FOR THE IMPLEMENTATION OF HUMAN TALENTS MANAGEMENT AND DEVELOPMENT SYSTEMS

The planned coaching activities took place in February and March 2012, when the human talents officers of CCI, CIC, and FPDA and the ARDSF consultant and advisor spent two weeks in the headquarters and research stations of CCI and CIC to conduct a series of two-day, hands-on events for groups of scientists, administration officers, extension workers, and assistant research officers. The aims of these events (each comprising 10 sessions)

were to: present and discuss issues to be included in the strategies, policies and procedures; to collect views and suggestions, before developing draft documents; and to involve the entire staff of each organisation in this process of changing the way that the institutes would deal with their human talents in future.

The staff members' contributions during these hands-on events were taken into account in preparing draft human talents strategies, policies and procedures for CCI and CIC. After approval by the managements of both organisations, these will become official documents to guide the implementation of their Human Talents Management and Development Systems as recommended by SMDHT Framework. Human talents planning, performance assessment, performance rewards and learning and capacity building were key issues discussed during these events and included in the draft human talents documents for both organisations.

Participants in the sessions agreed that human talents planning should comprise: the preparation of job descriptions based on job analysis, using the logical framework and program, project and project activity plans to align the human talents with organisational objectives; competence-based recruitment to re-deploy existing staff through internal recruitment, complemented by external recruitment where necessary; and a rigorous selection process led by the human talents officer to identify the most competent candidates.

It was agreed that performance assessment and personal development planning would require managers and employees to develop individual annual work plans, identifying operational methods and approaches, establishing timeframes and identifying performance indicators to assess technical and managerial competencies and attitudes. Performance rewards must be non-monetary, motivating staff through recognition and supporting their achievements and providing opportunities for job satisfaction. Finally, learning and capacity building must be an integral part of the performance assessment plan.

As noted above, the SMDHT framework, introduced in the human talents workshops in 2010, aims to provide support to the management of four key organisational areas: Strategy, Systems, Structures and Culture. Staff members need to be able to manage activities in these areas in order to maintain the coherence required to promote the total integration of the organisation and achieve its strategic objectives.

During April and May 2012, ARDSF implemented two series of two-day learning events designed to help scientists, administration officers, extension workers, and assistant research officers in CCI and CIC to develop the particular competencies and attitudes required to implement activities in these four areas. The learning modules developed to support these events aimed to facilitate learning in these areas by analysing the requirements of the AR4D approach.

Under the general heading, ‘Strengthening Organisational Culture’, the first series of six events dealt with leadership, creativity, organisational learning and techniques of oral presentation. The second series comprised four events under the general title ‘Building Intra- and Inter-Organisational Structures’, and dealt with such topics as total integration, interdisciplinary team building and conflict resolution, partnerships and agricultural research networks. In these workshops, strategies were presented as an important organisational factor that strengthens staff knowledge with key issues for analysis. Discussions on system development emphasised the importance of integrated management information systems combining information about programs, projects and project activities and organisational resources with the systems for monitoring and evaluation, human talents management and development, facilities management and financial management. Participants also worked on how to build flexible and responsive structures and intra- and inter-organisational structures that strengthen project implementation, through interdisciplinary teams, networks, and partnerships.

The discussions on culture attracted considerable attention from participants, with role-plays on interpersonal communication, self-analysis and reflection on the impact of behaviour on others, etc. Participants realised that AR4D calls for great interaction among different actors and these skills are vital for this interaction.

This range of intensive two-day events proved to be very effective. Participants appreciated the short and intense practical exercises. The exercises were designed to increase awareness, and understanding on the aspects of interpersonal communication, creativity, vision, interaction, self-analysis and feedback. The new learning was considered by some of the participants as an important factor that would impact their future performance within the organisations to achieve new strategic objectives. The content was considered appropriate and timely to enable staff to contribute to organisational change and new organisational arrangements.

ARDSF's human talents program concluded in May 2012 with a round table for a group of staff from CCI and CIC and designed to reflect on managing information systems to align strategies, structures, systems and culture and to plan the way forward for the two organisations.

CONCLUSION

In its five years, ARDSF, in collaboration with the PNG NARS, generated a series of positive results, identified obstacles, learned lessons and confronted challenges to be faced by CCI and CIC in the future through its efforts at capacity building and human talents management and development. Some of these efforts are described in the body of this chapter. However, it is important to emphasise a few of them in this section.

The learning needs and organisational constraints assessments, conducted in the NARS in the earlier years of ARDSF, identified numerous constraints that needed to be overcome if the NARS were to perform their roles in the development of PNG agriculture effectively.

Many of these constraints related to the need for NARS staff to develop more managerial and operational skills, and this need was addressed to a large extent in the learning and capacity building events organised under ARDSF. These included, for example, workshops on research-oriented program formulation, strategic planning, project planning and monitoring and evaluation.

Other constraints, however, related to the human side of the NARS organisations, and required ARDSF to adopt a different focus in its activities — a focus on the management and development of human talents. Participants in the LNA workshops from all the NARS identified a lack of proper human resources management and policies, lack of consultation and poor communication as factors that were adversely affecting staff and activities throughout their organisations, causing feelings of anxiety and frustration at all levels. They pointed to the need for NARS managements to learn to delegate responsibility, to develop a culture of trust and an appreciation of the need for staff to become more involved in managerial decisions. In short, they identified a widespread need for NARS managers to change their mindset and to recognise staff as the most important asset of their organisations.

ARDSF responded to these other constraints with a shift of emphasis from

learning and capacity building to human talents management and development. Within the NARS, this involved not only changes in the mindset of individuals, but also changes in the culture of the organisation, whereby the new mindset could be acknowledged and its value recognised.

ARDSF can claim to have achieved some success in bringing about changes in the mindset of NARS senior managers and scientists, in encouraging them, firstly, to change their focus from scientific outcomes to development outcomes among PNG smallholder farmers, and secondly, to value the role that human talents have to play in leading and driving the implementation of programs, projects and project activity plans to achieve the expected outcomes and impact. As a result, many NARS managers have begun to view the human side of the organisation as its most important asset.

There is still some way to go, however, in nurturing the changes in corporate culture that are needed for the changes in individual mindsets to have their full effect, not only on the workings of the NARS themselves, but also in their impact on smallholder farmers and other actors in PNG.

The Institutional Capacity Strengthening program, which was developed as a result of the research-oriented program formulation workshops, aims to transform the human talents function into a cross-program activity responsible for preparing the entire staff of the organisation to respond to the implementation needs of program, project and project activity plans. Based on the SMDHT framework, two of the NARS organisations — CCI and CIC — have taken concrete steps towards implementing new strategies, policies and procedures for human talents planning, including job descriptions aligned to programs, projects and project activities, recruitment and selection, performance assessment and performance rewards, and learning and capacity building. This will institutionalise the procedures for the organisation to continue aligning its human talents with its strategic plans.

One of these concrete steps has been for CCI and CIC to create and fill the position of human talents officer (which already existed in FPDA) to lead initiatives related to human talents management and development systems. Working as a team, these human talents officers will support one another as partners to expand the opportunities for capacity building among the three organisations in order to reduce expenses and maximise learning to sustain the continuity of the AR4D implementation process. They will be able to play active roles in promoting the necessary changes in organisational culture that

BOX 8.1. LEARNING APPROACH AND METHODOLOGY

The learning approach adopted throughout the ARDSF human talents program is a participatory learner-centred approach that enhances the effective transfer of skills, facilitates conceptual and attitudinal development, and encourages appropriate changes in participants' behaviour. It helps people assume responsibility for their own learning because it asks them to reflect on their experience, draw conclusions, and identify applications, drawing lessons from their actual work environment.

This learning approach was applied in a series of 30 workshops and other learning events, the framework for which was provided in most cases by a learning module that gave information on the subject matter of the workshop in question and detailed methodological guidance on how to conduct the workshop. Most of these modules were adapted from modules developed by the International Service for National Agricultural Research (ISNAR) and the International Food Policy Research Institute (IFPRI).

The original modules were adapted by the ARDSF team to reflect conditions in PNG and supplied to the workshop participants in hard copy and on interactive CD-ROMs.

A typical workshop module included a workshop plan explaining how the module was organised, while the text for each session included instructions to facilitators, a reproduction and summary of the PowerPoint presentation delivered during the session, and a number of handouts, including practical exercises and material for further reading.

It provided for evaluative feedback on the proceedings and applied the Participant Action Plan Approach (PAPA). PAPA aims to determine how the participants changed their job behaviour as a result of their participation in the workshop.

The workshop materials were provided in hard copy and on an interactive CD-ROM designed to enable the workshop to be repeated and, if necessary, further adapted, by NARS staff at a later date. Full reports on the workshops were also distributed to provide NARS staff with the detailed results. In total, the project produced 55 learning documents and reports in hard copy with a total of some 8,000 pages, plus 13 CD-ROMs.

In the later stages of ARDSF, in 2011 and 2012, the workshop approach was complemented in CCI and CIC by hands-on workplace mentoring of the staff who would be involved in the implementation of their Human Talents Strategies. Through this approach, groups of staff were able to participate intensively in the human talents management and development program.

Source: Authors

will enable their organisations to benefit from the changed mindsets of many of their managers and researchers.

However, there is a need for continued support to help the organisations institutionalise performance assessment without generating too much anxiety among staff. The staff of these organisations has welcomed the new approaches to human talents management and development, but need help to learn and engage in the process without fear and anxiety.

One key question now is: how can the approach initiated by ARDSF and the human talents team be sustained in the future? Implementing AR4D demands competencies and attitudes such as interpersonal communication, creativity, interaction, team building, vision, etc., to which individual staff members were not exposed during their professional development. The ARDSF learning events have addressed these skills to a large extent while identifying cognitive and affective domains of learning and conducting exercises in strengthening organisational culture and structures. These interventions have been positive but the organisations need continued support.

Broader cultural traits in PNG may also affect inter-personal communication and prevent individuals from self-motivating to work in teams, display team spirit, show respect and trust, etc. Nevertheless, within the PNG NARS, individuals have been changing; the question is how to extend this process to all staff in the PNG NARS. As staff members come to feel more valued by their organisations, it is hoped to avoid the high rates of staff turnover that have affected the implementation of ARDSF in the past.

Without the presence of, and guidance from, ARDSF, the continued development and implementation of AR4D activities in the future will place heavy demands on NARS staff at all levels. Major tasks still to be carried out by each organisation include the completion of its productivity improvement program plan and related project and project activity plans, and the creation of an integrated management information system. Some NARS organisations are eager and equipped to implement the human talents strategies for human talents planning, performance assessment and performance rewards, and learning and capacity building. The challenge is to wait until the entire program, projects and project activities and logical framework are complete so that the human talents management and development system can be aligned with the overall organisational strategy in accordance with AR4D principles. Senior managers will need to give a lot of attention and support to this process.

BOX 8.2. WHAT THE WORKSHOP PARTICIPANTS THOUGHT OF THE PROGRAM

The workshop modules and other learning materials produced during this program all included provision for evaluative feedback from participants. Throughout, this feedback was positive. Some typical comments from participants:

"My major lesson: we have to transform ourselves to transform the organisation."

"Transforms me in a better person now. It is motivating!"

"ARDSF having capacity building skills in place is really vital."

"The prioritising exercise was useful: learning by doing."

"The technique of priority setting really helped in deciding projects that need to be done."

"I learned the leading role of human talents in overall implementation process."

"Using logframe to identify competencies, attitudes and indicators to assess performance was very insightful."

"Great learning and very important to see senior participants contributing to ideas, though towards change."

"The emphasis of the AR4D paradigm at each strategic level is the paramount presentation. Each staff member needs to be reminded of the paradigm shifts that are going to transform the organisation."

"I discovered the importance of activity plan, budget and M&E plan to enable the achievement of project, program and organisation at high level objectives."

"Explanation of cascading logic in organisational, programs & project levels and who is responsible for what needs to be done. Strong event!"

"Challenges are to link outputs with respective activities."

"I was able to understand logical way of describing project + activities and had them aligned to the project objectives! Also I was able to see flow & logic from goal to project."

"Some values are related, but they reflect how people see us from outside. We have to reflect how we show our inner image to the community."

"My major lesson: Impact is associated with people performance! We must pursue it!"

Two comments received during the meetings between the human talents teams and the rest of the staff at CCI and CIC in December 2011 revealed how welcome the AR4D approach was to the staff of these organisations.

From a senior manager at CIC:

"I do hope that AR4D approach — which values Human Talents — is effective in motivating our staff. These proposals to deal with CIC staff are very much welcome, because CIC has not given the attention the staff deserve for years! Performance assessment has not been done for years! I observe lack of motivation, interest among our staff, but I cannot blame them because this is the

BOX 8.2. Continued

organisational mismanagement. I am glad that this new approach will change our organisation for the better."

At CCI, one employee said:

"I welcome this new approach to re-deploy staff based on competencies and on the freedom to apply for the job position. I have been in a position that I dislike. I am told to perform tasks that I do not like and I am not prepared for doing them. But I have a family to feed and...many times, when I go home, I feel guilty, because I did something which I was not competent for, I am aware of I did not do well, and yet, at the end of the month I receive my salary. This is not a good feeling! I am very happy that this will change!"

Source: Authors

As noted above, although there is still much to be done; many senior managers in the PNG NARS are now equipped to face the challenge of promoting the changes in organisational culture and individual mindsets which all NARS staff will have to accept if the principles of AR4D are to be successfully applied in PNG in the future. Despite some setbacks along the way, ARDSF can claim to have achieved some success in bringing about changes in attitudes and perceptions among NARS senior staff and thus, it is hoped, to have laid a firm foundation for the future.

TECHNICAL ANNEX

ARDSF LEARNING EVENTS AND MATERIALS, 2008–2012 (IN CHRONOLOGICAL ORDER)

Module 1. Leading and Managing for Innovation. Learning module. Working document. NARI, July 2008. xxxi, 361 pp. Modules I, 2 and 3 on 1 CD–ROM. (The materials comprising this module were used in a results-framing workshop held at NARI in 2007, before the learning and capacity building program was formally launched and the module itself prepared.)

Learning Needs and Organisational Constraints Assessment. NARI. Lae, July 14–15, 2008

Learning Needs and Organisational Constraints Assessment for NARI Program Level Management. Module xxix, 162 pp. CD–ROM

Learning Needs and Organisational Constraints Assessment for NARI Program Level Management. Workshop Report. NARI, Lae, July 14–15, 2008. xix, 69 pp.

Workshop on Results-Oriented Program Formulation. NARI, Lae, July 15–18, 2008

Module 3. Results-Oriented Program Formulation. Learning module. Working document. xxxi, 307 pp. Modules I, 2 and 3 (NARI) on 1 CD–ROM. Workshop Report on Results-Oriented Program Formulation, Lae, July 16–18. xii-74 pp.

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Facilitating the Agricultural Innovation Grant Scheme in PNG

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INTRODUCTION

This chapter describes the development and implementation of an agricultural innovation grants scheme as part of a capacity building process framed by AR4D. The grant scheme was critical to the capacity building process as it provided resources for agricultural research organisations to work in a new way as part of wider development activities. The development of the scheme illustrates the way its protocols were iteratively developed through a series of four grant calls. This helped fine-tune the targeting of the scheme towards innovation projects that had development relevance and made the most of research as well as developmental expertise of the partners involved. The success of the scheme has made it a potential candidate for scaling up as a national competitive grant scheme. Key lessons include the following: (1)

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The importance of creating an operational space to experiment and incubate a novel form of an innovation grants scheme; (2) The importance of ensuring that all key stakeholders fully understand the idea of innovation and the wider implications of AR4D for the design and operation of an innovation grants scheme; (3) The importance of conceiving and operating the scheme as a way of stimulating both agricultural production, process and marketing innovations, as well as innovations in the delivery of services; (4) The importance of developing institutional arrangements that make the scheme responsive to the changing development agenda; (5) The importance of avoiding the temptation to issue calls before basic institutional arrangements have been put in place.

RECAP: FUNDING INNOVATION IN AR4D

Innovation systems perspectives and the AR4D approach demand new types of projects that support innovation as the key means of generating sustainable social and economic benefits. This involves projects that combine research and development activities and that place strong emphasis on adding value to emerging opportunities. Projects may also tackle constraints in the innovation process — technical, institutional or policy bottlenecks — but this is done with a view to promoting innovation of social and economic significance (impact) rather than as an end in itself. The ways of funding these types of projects is different from the way research and extension activities are normally funded.

In the past agricultural research organisations were funded — either through competitive or core support — to generate new information and develop new technologies in response to different agricultural development constraints. Agricultural extension activities were then used to promote research-derived information and technology. This has usually been funded as a public service (rather than specific projects) because historically there were few or no service providers in the private sector and, relatedly, because of lack of effective demand (willingness to pay) for advisory services, particularly in the smallholder sector.

An innovation project is different from both a research project and extension services in a number of respects.

- The primary focus is not on conducting research, but on finding ways that research products and expertise can be used productively for

social and economic impact.

- The purpose is not just to transfer technologies, but to couple access to technology and expertise with access to markets, credit and other inputs and to create the institutional arrangements that make these links responsive to the needs of stakeholders in the innovation process.
- The scope of projects can go beyond agriculture and include related issues in education, health, energy, commerce and industry, and financial sectors.
- Different types of organisations, including development organisations, private enterprises, and research organisations, advisory and other support service organisations from the public and private sector can lead such projects. Leadership depends on the theme being addressed. Projects usually involve a coalition of different sorts of organisations working together.
- Projects usually address issues at multiple levels. This may involve technological change, but they usually also involve addressing issues in institutional arrangements (how things are done, incentives, etc.) as well as in the policy domain that frames activities and innovation.
- Different projects will, however, impact at different scales; some will impact on individual communities or enterprises. Some will impact value chains, while others will impact at regional and national scales.
- Projects are inherently process-driven — promoting innovation in different and dynamic contexts always needs to be learned and improved through trial and error. This means that learning-oriented mentoring systems are a key management tool in these projects.
- Projects have an explicit capacity development agenda. They provide space for organisations to work in new ways and with different partners. Such projects anticipate that institutional lessons (how to work differently for impact) are an important outcome.
- In these types of projects scaling **out** is not concerned with replication, but with linking together similar initiatives to promote lesson sharing

and wider innovation. Scaling **up** is not concerned with formulation of recommendations for policy, but on linking experiences and lesson learning to debates that shape wider policy and institutional frameworks and the nature and direction of development pathways.

Innovation projects can have entry points along a continuum of research to development activities. These include:

- *Technology adaptation and troubleshooting.* Adapting technologies to different contexts of application and conducting research to resolve “second generation” technical constraints encountered during application.
- *Strengthening technology delivery systems.* Creating viable demand-responsive delivery systems for new technologies, such as improved crop varieties, but also providing training in new production and marketing techniques and regulatory compliance. This may be done through the market or through public or civil society organisations providing advisory services.
- *Strengthening value chains.* Creating viable and equitable value chains that link smallholders to local, national and international markets. This might be in response to a new market opportunity. It may also be driven by new technological opportunities, such as new types of storage or value added agro-processing.
- *Strengthening social organisations.* Creating farmer or commodity groups and enterprises as a way of improving production, process and marketing. This may also be used as a way of better accessing inputs, such as seeds or credit, and as a way of collectively articulating demand of research services and advisory support.
- *Strengthening innovation brokering.* Supporting service organisations to use facilitation, intermediation and communication to help build coalitions of partners around emerging opportunities. This might involve undertaking research and/or setting up innovation platforms to identify new opportunities and bringing partners together to exploit these.
- *Enterprise incubation.* This often involves providing start-up

capital and technical assistance to enterprises involved in the commercialisation of new technologies or services to smallholders. It may also include mixed revenue business models, where products and services are paid in part by the market and partially from public or private subsidy.

- *Policy and institutional change.* This involves generating, synthesising and communicating information to policy-makers to change the framework conditions for a particular innovation pathway. It may involve support to specific interest group agencies; for example, an organic produce organisation. Alternatively it might mean supporting policy think-tanks to link development practice experiences with the policy process.

It needs to be stressed that these are only entry points for projects. International experience suggests that innovation projects work best when these different types of entry points are clustered together to address the different types of bottlenecks that projects encounter as the innovation process unfolds (Hall, 2011).

What does this mean for establishing and implementing grant schemes for these sorts of projects?

New projects will usually build on existing clusters of innovation activity — technological development, enterprise or developmental activity and market changes that provide opportunities for innovation of economic and social significance. Grant schemes, therefore, have to have scoping mechanisms to identify promising nodes of innovation.

Projects invariably require multiple partners, many of whom are unfamiliar with the bureaucratic procedures of grant applications. This means that grant schemes have to play a proactive role in brokering partnerships around promising topics and helping these groups develop fundable proposals.

Given that innovation projects are process-driven, funding and reporting arrangements need to be flexible enough to accommodate the changing shape of projects, while at the same time ensuring that they are accountable in terms of achieving smallholder impacts that have been the premise for receiving funds. We shall now see how these ideas played out in the experience of ARDSF.

BUILDING THE CAPACITY OF AN AGRICULTURAL INNOVATION GRANTS SCHEME IN ARDSF

The establishment of an Agricultural Innovation Grants Scheme (AIGS) was the third component of ARDSF. Its overall purpose was to promote agricultural innovation in order to improve agricultural productivity and increase incomes and food security among smallholder agricultural producers in PNG. The design of ARDSF recognised that this purpose — a national-level development ambition — would be achieved if AIGS delivered four outcomes:

1. The first outcome to be delivered was increased opportunities for smallholder farmers to improve productivity and market competitiveness. In practice this meant establishing a portfolio of new types of innovation projects that together would provide these opportunities to smallholders.
2. The second outcome to be delivered was the establishment of a national grants scheme for PNG agriculture development. This meant that the AIGS would be a pilot for a national-scale agricultural innovation scheme. It would have to develop institutional arrangements that were tailor-made to administering the portfolio of new innovation projects. It would also have to find a way to channel lessons from this experience into debates about how to establish a national scheme.
3. The third outcome to be delivered was improved performance of agricultural research and extension organisations, including both government and non-government agencies. What was implied here was that the AIGS would fund new types of partnership-based activity that would allow these organisations to collectively better deliver services to smallholders. This gave an operational focus to the capacity building efforts under other components of ARDSF, where emphasis had been placed on partnership between research and other organisations as a way of achieving impacts on smallholders and national development targets (see chapters 5, 6 and 7).
4. The fourth and final outcome was mainstreaming issues around gender and HIV/AIDS through AIGS activities. These aspects had also been stressed in capacity building efforts under other components of ARDSF; for example, in their new strategic plans (see chapters

5, 6 and 7) gender and HIV/AIDS mainstreaming were an integral component of achieving productivity and livelihood outcomes. AIGS was to provide operational focus for this mainstreaming in new activities.

As can be seen the AIGS component of ARDSF was ambitious both in terms of its purpose, but also in terms of the magnitude of the institutional innovation required to achieve this purpose. After all, this was about funding an entirely new way of working for all those involved and it meant that the AIGS would need to drive this institutional change. It implied innovations in both agricultural production and delivery of agricultural support services. It implied new partnerships and unfamiliar partners. It implied shifting from funding technology transfer and promotion to funding innovation in the widest sense of doing things differently for social and economic gain. It implied creating a mechanism to exchange ideas and new structures to manage and channel these to achieve national-scale development targets. It implied creating the machinery to administer and govern this in a competitive, transparent and accountable way. And, perhaps most challenging of all, it implied that this was an experiment where institutional arrangements had to be learnt and refined along the way in the hope that this would set the stage for a national scheme.

Of course, ARDSF was not starting from scratch when it established AIGS. ARDSF's predecessor, the Australian Contribution to a National Agricultural Research System (ACNARS), had included a competitive grant component. This earlier competitive grant — the Agricultural Innovation Grants Facility (AIGF) — had, despite its name, been designed as a way of delivering technologies from research organisations to smallholders.

So, while AIGF had established the idea of a competitive grants scheme, its purpose and institutional arrangements had been quite different to what was envisaged for AIGS. This proved to be a major challenge for AIGS because it inherited the staff and administrative and governance procedures from AIGF as well as the mindset that went with this.

The subsequent development of AIGS is, therefore, a story of the negotiations and institutional innovations involved in transforming a funding apparatus designed to transfer technology into a funding apparatus designed to promote innovation. This is a situation likely to be encountered in other countries that are adopting the AR4D perspective.

To understand this process of transformation it is useful to explain briefly AIGS's ancestry in the AIGF as this is the institutional baseline against which to benchmark AIGS achievements.

THE INSTITUTIONAL ORIGINS OF AIGS

ARDSF's predecessor in terms of support to the PNG NARS was the ACNARS (Australian Contribution to a National Agricultural Research System) project that ran from 1998 to 2006. Its purpose was to:

Assist the establishment of NARI (National Agricultural Research Institute) as an efficient and effective research organisation with the capacity to identify farmers' needs, prioritise responses, achieve cost-effective results and communicate with stakeholders.

ACNARS included a competitive grant facility — the AIGF — with the rationale that it would test the demand for operational budget support to the PNG NARS activities on research and information dissemination (ACNARS, 2004). Projects under AIGF were selected on their ability to show direct benefit to rural smallholders with priority given to activities likely to have a demonstrable positive impact within 12 months of funding.

The purpose of the AIGF, in actual fact, was not so different from that of the subsequent AIGS in that it targeted improved productivity, efficiency and sustainability of smallholder agriculture. The critical difference, however, was that AIGF's vision of how this would be achieved was through dissemination of research and information, whereas AIGS hoped to achieve this through promotion of innovation. As will be discussed shortly the understanding of what innovation actually meant became pivotal in the reframing of AIGS.

An independent project completion report of ACNARS (AusAID, 2006) found the AIGF was sufficiently successful in terms of piloting the concept of a competitive grant scheme for such an arrangement to be included as a component in the ARDSF design, albeit in a modified form.

A lesson learning evaluation of AIGF undertaken in 2009 (ARDSF, 2009) was more critical. It confirmed that individual projects had achieved adequate levels of smallholder-level impact. However, it found little evidence of 'added value' across the portfolio. The major reasons identified for the lack of 'added

value’ were the weakly structured approach to project portfolio development against an identified AIGF strategy, coupled with a lack of attention to the concept of ‘innovation’ in the project identification and development process. In other words, there were many successful individual projects but no strategy or vision that clustered these towards the achievement of higher-order development ambitions.

The evaluation (*ibid*) also noted positive aspects of the AIGF portfolio, including the fact that there were a minority of projects that were ‘more ambitious and less conventional’ and which demonstrated ‘engagement and perception’ with innovation processes and smallholder needs. These were found to provide the most sustained impact and the approach of these was noted as being consistent with the AR4D approach that AIGS/ARDSF subsequently adopted.

These evaluation findings reveal much about the nature of AIGF as a competitive funding mechanism. It was driven by available research inputs into the innovation process rather than using development outcomes as the key organising principle for project selection and clustering. Also, it gave little attention to how innovation processes could be sustained either by the market, social networks or other development interventions once the project was completed.

The timing of the evaluation is critical to how AIGS developed. It was not done immediately after the end of AIGF in 2006, but in 2009 — three years after the start of AIGS/ ARDSF. What this meant in practice was that AIGS inherited much of the institutional apparatus of AIGF, but, as we have seen, with a much larger purpose to deliver. Our discussion below will illustrate the way the results of this evaluation of AIGF were pivotal at a critical stage in AIGS’s institutional development.

THE EVOLUTION OF AIGS

At its establishment in 2006 AIGS inherited key managers from the AIGF management team. They, in turn, brought with them the AIGF operational guidelines and manuals as a blueprint for AIGS. This included governance arrangements — notably a Technical Appraisal Panel (TAP). The role of the TAP was to undertake a technical appraisal of projects. Later, an advisory function was added and the panel’s name was changed to the Technical

Appraisal and Advisory Panel (TAAP). The design introduced a further governance body in the form of a reformed Advisory Selection Committee (ASC). The ASC subsequently changed its name to AIGS Scoping and Selection committee (ASSC) for reasons that will be described below (see also box 1). The role of ASC was to review the recommendations of the TAP and select projects that would form part of a coherent portfolio of innovation projects addressing the purpose of AIGS. As will be related shortly, this arrangement had to evolve significantly so that the ASC could add value to the technical appraisals of the TAP.

At the outset of AIGS tensions were starting to emerge within the ARDSF secretariat about the role of AIGS within ARDSF. There was one point of view that saw AIGS as a continuation of AIGF, with a primary focus on ensuring the delivery of technologies from research to farmers. In fact, this point of view reflected the perception that ARDSF was itself about building the capacity of the extension function within the National Agricultural Research System and that the key task was to fund and develop delivery mechanisms. This position was reinforced by the professional perspectives of staff who had previously worked in the AIGF and by the perspectives of the early leadership of the ARDSF.

The opposing point of view was that the role of AIGS was about promoting innovation in both agricultural production and service delivery. This was not about technology transfer, per se, but about helping the NARS organisations develop their capacity to plan and work in an entirely different way. The AIGS component of ARDSF was seen as an integral part of the capacity building efforts in its other components.

This view partially emerged from the initial engagement with the NARS organisations, where it was felt that capacity building needs related to the need to adopt systemic approaches in order to achieve innovation and impact. Of course, this view was also one that was gaining ground internationally through ideas like the innovation systems perspective and AR4D — ideas that some of ARDSF's international staff had exposure to.

Reflecting on those early days of AIGS, team members noted that a key point of contention was the understanding of what innovation actually meant. One camp retained the view that innovation was a process of research-driven technological change — in the early days this view also prevailed in the TAP and ASC. The other camp viewed innovation as any change (technical,

organisational, institutional) that had social or economic significance and impact.

These sorts of debates, which were at times acrimonious, dogged the first 18 months of AIGS and were only resolved by an inception review that endorsed the proposed new direction of AIGS. As a result of these varying perspectives, AIGS's calls of Expression of Interest (EOIs) were substantially delayed. Consequently, the donor (AusAID) began to exert pressure for action. The first AIGS call was made in November 2007, nine months into the life of ARDSF.

The first AIGS call. Theme: open call

Against a backdrop of disagreement about its role and under pressure to fund projects, AIGS made an open call for expressions of interest in November 2007. It received 90 concept notes. The process of review by the TAP and approval of 19 of these concept notes is illustrative of the challenges that AIGS faced in retooling for its new innovation-driven purpose.

The TAP reported its review of concept notes to the ASC, which rejected its findings. The TAP had grouped expressions of interest into three categories: (a) Those that were considered good to proceed to development of full proposals; (b) Those considered fairly acceptable but needing modifications for re-submission; and (c) Those considered not responding appropriately to the call for expression of interest and which, therefore, needed to be rejected. The ASC downgraded many category (a) concept notes to category (b) but upgraded many in category (b) to category (a).

At the heart of the problem was the fact that there was no strategy or overarching plan of how AIGS would achieve its purpose. There was, therefore, no clear objective criteria for deciding which projects should be selected. Nor was there agreement about what an innovation project should look like. Projects selected were similar to those selected under AIGF. These projects were not especially flawed other than the fact that they were not part of a logical plan on how to deliver AIGS's purpose.

Under the usual competitive grants procedure of AIGS's predecessor and the ARDSF design, it was standard practice to subject proposals to a two-stage process of concept note approval and then preparation and approval of a full project document. The first AIGS call cut this procedure short by approving the projects at the concept note stage, with proposals being submitted after

approval. The concept notes — also called Expressions of Interest — were reviewed by both the TAP and the ASC. However, the full proposals were only reviewed by the ASC. Clearly this was going to be problematic as there was no way of ensuring the planning logic of the final proposals or making them accountable to specific outputs. This shortcut was taken because of time constraints and the pressure to get projects up and running quickly. Part of the problem was also that the AIGS team was itself unfamiliar with the development of proposals for innovation projects and could provide only limited assistance. Everyone was still learning how to work in this new way.

Scoping workshop

This rather unsatisfactory course of events is understandable given that this was AIGS's first call. However, it did highlight the urgent need to clarify the “rules of the game” to ensure that the TAP and the ASC were working from the same script. As a consequence the ARDSF Secretariat was tasked with the development of a scoping framework that would provide an overall programmatic vision for AIGS.

This process reached the stage of holding a workshop on what a scoping framework would involve. The workshop established the principle that each call would need a scoping framework. This framework would:

- Identify broad areas of innovation to form the basis for each call. Specific innovations within each call would be left to the grant applicants
- Clarify competing areas of focus to facilitate priority-setting and allocation of resources
- Clarify inter-related areas of focus to provide opportunities to sequence investments, and generate synergy among projects. It was anticipated that this would enhance chances for impact at scale through a series of related-pilot, out-scaling and up-scaling projects
- Facilitate concentration of resources on priority areas, enabling mobilisation of the critical mass necessary to deliver impact at scale

It was also around this time that governance arrangements for AIGS were clarified. Proposed governance arrangements arrived at through this process are presented in box 9.1.

One of the critical clarifications concerned the role of the ASC. Under the arrangements inherited by the AIGS, the ASC did little more than rubberstamp

BOX 9.1. GOVERNANCE ARRANGEMENTS PROPOSED AT THE INCEPTION OF THE AIGS

- Consistent with the ARDSF design, the AIGS selection committee would also serve as the scoping committee for the AIGS. The committee would consist of eminent national representatives so that the decision-making would be sensitive to the evolving needs of PNG agriculture and increase a sense of national ownership.
- In view of the expanded role of the AIGS Selection Committee it was considered appropriate to change the name to Scoping and Selection Committee (ASSC).
- The appraisal process would be done by a technical assessment panel (TAP) based on rigorous scientific and selection criteria. The technical panel would consist of two national and one international member.
- The ARDSF Secretariat would screen the concept note expressions of interest (EOI) and the full proposals to ensure they complied with all administrative pre-conditions.
- The ARDSF Management Committee would be responsible for monitoring and evaluation of the AIGS to ensure it contributed effectively to the achievement of the overall ARDSF goal and purpose.
- However, selection and award of grants would remain the sole responsibility of the ASSC.
- All potential actors (including CBOs, NGOs and private sector), with a role to play in achieving expected outcomes of the AIGS, would need to be seen to be fairly included in the selection process. To achieve this, the AIGS Secretariat would advertise broadly, even in remote areas of the country. The Secretariat would also need to proactively broker partnerships to ensure effective service delivery.
- The AIGS Secretariat would set deadlines for each funding call to prompt prospective applicants to action and to allow timely scheduling of subsequent calls.
- The AIGS Secretariat would conduct a road show as an integral part of the advertisement process of the respective EOIs.
- The AIGS Secretariat was encouraged to develop a comprehensive results framework to guide the implementation process. The framework would include all expected results — distinguishing shorter-term deliverables and longer-term outcomes and impact.

Source: Authors

the approval of projects selected by the TAP. The experience of the first AIGS call made it clear that the ASC needed to be equipped with a way of judging the relevance of projects in terms of their contribution to the wider purpose of AIGS. This is, of course, where the idea of scoping calls arose, as discussed earlier. This meant that the role of TAP and ASC became quite distinct. TAP performed a technical appraisal, whereas ASC would determine the scope of

the call and the fit of projects into this call in view of higher-order objectives. The name of the ASC was changed at this point to ASSC to reflect its new scoping role.

However, before these proposed institutional changes could proceed beyond the planning stage, a second AIGS call was made.

The second AIGS call. Theme: open call

By the time of the second call in June 2008, six months after the first call, pressure was once again mounting to disburse more funds through AIGS. The tension around the role of AIGS and about the nature of innovation still had not been resolved within ARDSF and within TAP and ASC (from now referred to as ASSC). As a result the second AIGS call was once again an open call. Also, because there were limited concept notes submitted, many of those that had not been selected for funding in the first call were reviewed again.⁶

At this point ARDSF had already been running for nearly two years and was starting to make significant progress in its other two components. Under these components ARDSF was stimulating considerable rethinking about how research organisations could and should work differently for impact.

At the centre of this rethinking was the use of AR4D as a way of better positioning research and extension within the wider process of innovation. This, in turn, meant making links between this process of agricultural innovation and national development goals and reflecting this in the organisational plans of research organisations. The development of these strategic plans was yet to happen, but there was a growing awareness in these organisations about working and planning in a different way and the power of AR4D as a framework to guide that change.

By this stage personnel from the research organisations were becoming quite comfortable with these ideas — mainly because they saw them as a solution

⁶ Actually there were 124 concept notes. However, following the controversy between the TAP and ASC in the first call, the TAP refined the evaluation criteria and clarified the concept of innovation. They used the new-found insights to streamline the assessment process. As a result of this, 26 concept notes were recommended to develop into full project proposals; 23 were referred for modifications and the rest were rejected (75). When the TAP shared their insights with the ASC, it led to a breakthrough understanding between the two organs. The ASC accepted the TAP recommendations as presented. With this clarity reached, it was easy to agree on the assessment of the full project proposals. Only four were approved for funding.

to their weak impact track record. But, of course, it was precisely these ideas that had been so acrimoniously contested within ARDSF, with the AIGS team and with its governance bodies. With the momentum of this vision of agricultural research for development and the role of innovation within this vision starting to build from the NARS organisations, AIGS made a critical breakthrough with the chairman of the TAP.

The TAP chairman began, like the NARS organisations, to start to appreciate the potential importance of rethinking agricultural development in AR4D terms — particularly the idea of innovation as a metaphor for doing things differently for change and impact. Armed with these new insights the TAP screened the Call 2 concept notes and presented a report to the ASSC recommending only 26 out of the 124 concept notes to be developed to full project proposals. Only four out of these were eventually approved for funding. This was met with a degree of surprise. However, the TAP chairman was able to defend the rejection of most concept notes and full project proposals because his new-found understanding of the AR4D logic provided a lens through which concept notes could be appraised, filtering out those that wouldn't contribute to the promotion of innovation for impact.

The TAP chairman had to work hard to get his ideas accepted by the ASSC. It was, however, fundamental in the development of AIGS. It meant that finally the key players in its management and governance could start and develop the institutional arrangements needed not just to make AIGS an effective way of funding innovation, but to allow it to fulfil its wider role of supporting institutional innovation within the PNG NARS.

A result of this was that ASSC recognised that it was going to need to be better equipped to play its scoping role. It was at this stage that the committee requested ARDSF to facilitate a workshop prior to the next AIGS call to determine the scope of the call and to start and develop the results framework and other monitoring arrangements so the progress of AIGS could be better tracked and managed.

The scoping process

The scoping workshop saw deliberations among ASC members, the ARDSF Secretariat and key stakeholders and helped the program arrive at a number of key principles and assumptions as the basis for a scoping framework for AIGS. These are summarised in box 9.2 (see also the Technical Annex at the end of this chapter.)

BOX 9.2. KEY PRINCIPLES AND ASSUMPTIONS IN THE DEVELOPMENT OF THE AIGS SCOPING FRAMEWORK

Responsive to client and stakeholder needs and market demands: The agenda of AIGS projects must be demand-driven and should be based on the needs of stakeholders along the value chains (from production to consumption), particularly smallholder producers.

Alignment to sector and sub-sector development objectives: AIGS must complement and be aligned to the objectives of the national agriculture sector and sub-sector development plans, including the PNG Vision 2050, Medium Term Development Plans, the National Agriculture Development Plan and sub-sector development plans focusing on individual commodities and factors.

Value chain mapping and targeted investments: Value chain mapping needs to be used to define relationships among various players and the trigger points that may unlock value along the chain. Such trigger points would constitute potential thematic areas for focusing AIGS investments and, hopefully, mobilisation of the critical mass necessary for impact.

Linkages and partnerships: AIGS would promote effective collective action through partnerships and linkages among diverse actors with shared aspirations that deliver impact at people level. Such partnerships would include the public sector, private sector, non-governmental organisations, and community based organisations.

Scale of investments: Given the limited size of AIGS funding (up to K250,000 or approximately US \$120,751), it was understood that the relatively small projects would only deliver impact at pilot level. To increase chances of up-scaling impact the scheme would earmark a specific amount of resources to priority thematic areas.

Balance between income generation and food security: Improved livelihoods for smallholder farmers in PNG would depend on household food production as well as income generation. AIGS decided to aim for a balance between the two objectives.

Building on previous investments and lessons of past work: AIGS would build on previous investments and lessons from past work, with a view to generating synergy and sequential logic necessary to attain long-term objectives from short-term project-based investments.

Ability to leverage resources: Whenever possible, AIGS projects would seek to leverage additional resources from related initiatives. This would be pivotal in determining whether proposed initiatives would be sustainable in the long run.

BOX 9.2. Continued

Cross-cutting issues: It was appreciated that women constituted the bulk of agricultural producers in PNG, and that HIV/AIDS posed one of the biggest threats to agricultural sustainability. All proposed projects would need to demonstrate the extent to which they had taken gender and HIV/AIDS into consideration in project design, budgets and the monitoring and evaluation systems.

Sustainability of AIGS: The key to AIGS sustainability would lie in its expected outcomes: supporting agricultural innovations for improved productivity and related incomes and food security; establishment of a national grants scheme for PNG; improved performance of agricultural research and extension organisations, including both government and non-governmental agencies; and Gender and HIV/AIDS mainstreamed through AIGS activities. Thus, while effort would be made to ensure that each of the funded AIGS projects would be successful in its own right, it was the value added of a coherent portfolio that would allow AIGS to deliver its purpose.

Source: Authors

As can be seen from box 9.2, AIGS was starting to make significant progress in getting its institutional arrangements in place even if its actual funded projects left much to be desired. Three other significant events helped in AIGS's evolution at this stage.

The first was the externally commissioned inception review (AusAID, 2008) that was sympathetic with the idea of AIGS driving innovation as a critical factor in achieving ARDSF's outcome and goal. The report encouraged ARDSF to conduct an impact assessment of AIGF and draw lessons for the development of the AIGS. The recommendation echoed a similar recommendation made in the ARDSF design document.

The second was a series of staffing changes in ARDSF. Driving these changes was the realisation that the task of capacity building that ARDSF was responsible for was not simply about strengthening extension-like arrangements and developing improved human resource management practices in the NARS organisations. Rather, it was recognised that it involved helping the NARS learn a fundamentally different way of working that would allow them to become effective players within an integrated system of agricultural innovation. This clearly needed a different staffing profile. Leverage by the donor was critical in ensuring that this re-staffing took place.

The third significant event was the lesson learning review of AIGF that was referred to earlier. The findings of this evaluation reconfirmed the value of an AR4D perspective on the design and operation of an innovation grants scheme of the sort being attempted in AIGS. Of particular importance was the evaluation's emphasis on the need for a structured approach to the development of the project portfolio as the key to the delivery of a challenging purpose for AIGS. It was also noted that the ASSC needed to become a community of champions for the agricultural production and institutional innovations that AIGS was designed to address. The evaluation was, therefore, valuable in adding legitimacy and direction to the institutional transformation that was already underway.

The scoping framework

By this point momentum was building in AIGS. A third call was imminent and the ASSC decided to commission a study to formulate a scoping framework for AIGS. The study consulted key actors in the agricultural sector and reviewed available secondary data. The actors interviewed included private sector, non-governmental organisations, community based organisations, agricultural research and extension organisations, government departments and education organisations. Eleven areas of concern were identified in the following order of priority (high to low): policy, standards and regulations; value addition; social capital; sustainable farming; natural resource management; market development; information and communication; business skills; access to markets and market information; and entrepreneurial skills (See table 9.1).

It is worth noting that this framework study was conducted at around the time the NARS organisations were working on their strategic plans. This planning process had also encouraged the NARS to develop strategic objectives for programs of work that would help them achieve improved service delivery to farmers (see chapters 5, 6 and 7). This eased consultation during the scoping study, as many of the key stakeholders were already starting to give serious thought to the sorts of priority areas of innovation needed in a new vision of agricultural research for development. It also meant, of course, that there was congruence between the priorities identified by the AIGS scoping framework study and the emerging strategic plans of the NARS organisations.

Of particular note here is that these priorities were not couched in terms of technological constraints that needed to be addressed or new types of technology that needed to be promoted. Rather they were couched in terms of broader issues that were framing the ability of smallholders to take advantage

TABLE 9.1. PRIORITY THEMATIC AREAS FOR AIGS SUPPORT

Thematic Areas	Organisations and Category					Score
	Private Sector	NGOs	Research	FBO/CBO	Government Departments	Education Organisations
Policy, Standards & Regulations	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Adding Value (especially to Primary Products)	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓✓
Access to use of Knowledge (Use of Social Capital)	✓✓✓	✓✓✓	✓✓	✓✓✓	✓	✓✓✓
Sustainable Farming	✓✓✓	✓✓✓	✓✓	✓✓✓	✓✓	✓✓
Natural Resource Management	✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓	✓
Market Development	✓✓✓	✓✓	✓✓	✓✓✓	✓✓	✓✓
Information and Communication	✓✓✓	✓✓	✓✓	✓✓	✓✓	✓✓✓
Farming and Farm Business Skills	✓✓✓	✓✓✓	✓	✓✓	✓	✓✓✓
Entry to Market Chain	✓✓✓	✓✓✓	✓	✓✓✓	✓	✓
Market Information	✓✓✓	✓	✓✓	✓✓✓	✓	✓
Entrepreneurial Skills	✓	✓✓✓	✓✓	✓	✓	✓✓

Source: Allan Oliver, *Agricultural Innovation Grants Scheme (AIGS) Scoping Study (2009)*

Note: The tick marks in each column indicate the relative weight given by different actors to the areas of concern.

BOX 9.3. ILLUSTRATION OF AN INNOVATION PROJECT FROM CALL 1

Project title: Positive Sustainable Development of Smallholder Farming Communities through Value Addition and Market Improvement of Coconuts in Gazelle District

Lead and other partners: Pacific Spices Ltd.

Duration: Initially one year, but extended by one more year due to implementation problems

Budget: K250,000 (approximately US \$1,20,751) approved and fully utilised

Rationale: This project focuses on value added agro-processing and marketing and involves a partnership between a private company and community groups. In the Gazelle District, the coconut industry has been relatively unsuccessful over the last 20 years due to the inconsistency of prices of copra, increasing costs of fuel and unavailability of all-weather roads. This has led to a decline in production of coconuts and copra at the farmer level. Partly in response to this, Pacific Spices Ltd, a private company, has started processing and value addition of selected cash crops to encourage farmers to produce these crops. This, in turn, helps Pacific Spices Ltd ensure consistency of supply. One of the initiatives involves the Sinivit community of Pomio District.

Main activities: Pacific Spices is working with community members to process coconut into virgin coconut oil and is marketing this in PNG and overseas. This helps households maintain regular cash income from coconut production. Besides providing technical know-how on producing organic products for the world market, the company has also helped increase shipping freight services to the district, ensuring that the produce reaches intended markets at least cost. The partnership has since been extended to include East New Britain Provincial Government and the Catholic Mission.

The project funded the following activities:

- *The renovation and upgrading of an existing building to a value added processing facility provided an efficient product flow that not only reduced handling but maximised production capacity.*

of production and marketing opportunities. Of most significance was the fact that the number one priority — by significant margin — was given to policy and institutional factors. This implied that the next AIGS call needed to be focused on this topic.

Box 9.3 and 9.4 illustrate innovation projects funded under AIGS' first Call.

BOX 9.3. Continued

- *Purchase and set-up of specifically selected coconut processing equipment, resulting in the production of quality virgin coconut oil and other coconut by-products.*
- *Hands-on training of staff regarding product quality and hygiene issues associated with high value/ perishable food products coupled with the consistent production of coconut oil.*
- *Storage facility for a crystal clear virgin coconut oil that allowed for packaging of 350 kgs of organic virgin coconut oil for export to Japan.*
- *Logistic arrangements for a copra buying point at Induna Plantation to provide an on-site market for farmers.*
- *Data collection from farmers in three outreach communities — Merai, Lat and Gar — including crop and production history.*
- *Organic certification for grower group and processing facility gained to the international organic standard (IFOAM). Coconut, Nutmeg, Patchouli and Cocoa listed as organic.*
- *Five-day visit to Rabaul by a market in Australia looking for consistent supply of coconut oil. Sales agreement discussed and agreed for the supply of coconut oil and other coconut products on a monthly basis.*

Roles of different partners:

Pacific Spices Ltd. and the Catholic Mission work in partnership on the Induna Plantation that is owned and managed by the Catholic Mission. Farmers in the vicinity of the plantation sell their produce for processing. In addition, Pacific Spices provides the certification process for organic coconut oil production and links farmers with the Sea Transport and Marketing Service, leading to better prices for their produce. This partnership clearly demonstrates the role of an integrated approach to rural development, whereby the development of transport routes to and from the market will pave the way for additional economic and social development to take place in the area.

Outcomes:

- *Linked the local coconut market with international markets in Canada, Japan, Europe and America, through value adding and organic certification of their products*
- *Market opportunities have encouraged farmers to invest their time and other resources to improve profitability levels*
- *Has created network of local communities, using family ties and village leadership to promote production and productivity of coconut, especially organic production methods and techniques*
- *Anecdotal evidence indicates that farmers are using increased incomes to provide better healthcare and education for their families*
- *The initiative that began in one ward has now expanded to three wards*

Source: Authors

BOX 9.4. ILLUSTRATION OF AN INNOVATION PROJECT FROM CALL 1

Project title: Pyrethrum Extension in Enga Province

Lead Organisation: Enga Pyrethrum Company

Partner Organisations: Botanical Resources Australia Pty Ltd. and National Agricultural Research Institute (NARI)

Duration: Initially one year, but extended by one more year

Budget: K250,000 (approximately US \$1,20,751). Total amount used on completion: K156,045 (approximately US \$75,370)

Rationale: The ability to grow the crop profitably in high altitude areas has provided a rare opportunity to raise incomes of some of the most marginalised people in the province, including women and youth. The main objective of the pyrethrum project in Enga Province is to expand pyrethrum production to meet a shortfall in supply to the privately-owned Enga Pyrethrum Company in Mt. Hagen.

Main activities:

- Established extension delivery system for pyrethrum industry. Training of farmers on specific industry practices, providing growers pamphlets after training, organising exchange visits, incorporating gender and HIV/AIDS education in all activities.
- Improved production and productivity of pyrethrum: Expand nurseries for planting materials, increased supply of improved seeds, expand area coverage with pyrethrum, provide incentives to growers
- Established partnerships with other organisations
- Provide technical services such as soil testing and crop protection techniques
- Improved soil fertility techniques such as composting
- Introduction of legume plants
- Harvesting and marketing of dried flowers

Role of different partners: The project is a collaborative initiative, with Enga Pyrethrum Company hosting it and providing technical support services. Provincial and local governments provided liaisons and promotion services to the pyrethrum industry. NARI provided support (such as pyrethrum and moisture analysis) to the manufacturing factory at Kagamuga, Mt. Hagen as well as advice on soil fertility and plant tissue nutrient analysis in growing areas. Botanical Resources Australia Pty Ltd. provided overall management guidance and support to EPC and NARI and technical advice to growers during visits. This helped improve livelihoods of the poor in Enga Province. Government agents also promoted the activity in community meetings held in various districts.

BOX 9.4. Continued

The province produces more than 90% of the pyrethrum flowers produced in PNG.

Outcomes:

The total number of pyrethrum growers in recent years exceeds 10,000 farmers. Out of these, 86% are women — pyrethrum farming is labour-intensive and women dominate the industry. The company employs one female extension officer, three female field supervisors, and five male nursery field workers. The project encourages crop rotation between pyrethrum and diverse vegetables to ensure increased incomes and balanced diets. The project provides regular courses on food selection and preparation of nutritious meals. Among the growers there is great interest to establish cooperatives that are likely to ensure sustainability of their livelihoods.

Source: Authors

The third AIGS call: Marketing and value chain development

The scoping study report was submitted to the ASSC and broadly endorsed. However, the ASSC considered that the top-most priority theme of policy and institutional change was too challenging. Of course, the irony was that policy and institutional change was in many senses the centre piece of the capacity building approach that AIGS — and ARDSF, more generally — was trying to stimulate. The ASSC did, however, feel more comfortable with the next priority scoping area of agro-processing value addition. As a result the third AIGS call was formulated around marketing and value chain development in November 2009.

The precise formulation of the call and the procedure for developing proposals was also different. The call for concept notes asked for submissions of proposals that identified promising types of innovation. The plan was that concept notes would be shortlisted based on the potential of the innovation identified to create new livelihood opportunities. Once selected AIGS would then help proposers make the most of this innovation by linking them to appropriate partners and helping them design their projects so that impacts could be achieved. This approach necessitated a clear articulation of what was meant by ‘innovation’ in the wording of the call. The following definition was arrived at:

- A new product or service
- A new production process

- A new way of working together that delivers value for men and women clients and stakeholders
- A new way of marketing or activities in the market
- Necessary for the innovation to be already beyond the stage of a good idea — showing evidence that the idea was already working on a small scale
- Potential to benefit large numbers of men and women in Papua New Guinea

This call received 130 concept notes. These were screened by the TAAP and ASSC selected 13. The profile of the funded projects is illustrative of the progress that AIGS had made in transforming itself. Of the 13 projects approved, eight were led by civil society organisations. Nearly all projects included private sector partners, who led a number of them. This was in contrast to the first two AIGS calls, where almost all funded projects were led by research organisations.

The fourth AIGS Call: Theme: Promoting cross-sector linkages between agriculture, health and education

The fourth call took place in November 2010 in ARDSF's final year. By this time the institutional apparatus of AIGS was in place and the ASSC had become an effective way of shaping calls. An important aspect of this was the way it could fine-tune the agenda of calls based on AIGS's progress and the way it could respond to changing conditions in the wider development environment in PNG. Two features of the fourth call illustrate this.

The first feature is that the fourth call added a regional dimension, prioritising specific areas of the country. This was in response to observations that projects funded in earlier calls had tended to gravitate towards more favourable areas. If this was not addressed ASSC felt it would undermine the scale of AIGS's impact. It would, of course, mean that already disadvantaged regions and people would miss out on the benefits of AIGS.

The second feature was that the fourth call focused on innovations at the interface of agriculture, health and education. This ambitious cross-sectoral focus was, in a sense, a tactical response to the changing policy environment among donors in PNG, including AusAID. In particular, there was an increasing trend towards dropping agriculture in favour of health and education as preferred sectors of support and as the perceived pathways

BOX 9.5. ILLUSTRATION OF AN INNOVATION PROJECT FROM CALL 4

Project Title: Trial of School Coffee Curriculum

Lead Organisation: Coffee Industry Corporation

Partner Organisation: National Department of Education

Duration: Initially one year, but extended to two

Budget: K163,961 (approximately US \$79,194), amount utilised: K90,430 (approximately US \$43,678)

Rationale: The school curriculum development project is hosted by the Coffee Industry Corporation (CIC). The project intended to address the problem of a lack of appropriate coffee knowledge and skills in schools and the community. Before the initiation of the project school leavers demonstrated a lack of relevant coffee production knowledge and skills to make a living in the communities where coffee growing is a part of life. Teachers in schools did not have a coffee curriculum to assist them and were themselves not well-equipped with coffee knowledge and skills as most agriculture training providers only offer generalist programs.

The coffee curriculum trial is an innovative idea that targets the informal sector. The curriculum will complement the existing coffee extension system that focuses on the formal sector of the community. The project is aimed at promoting a coffee growing culture in PNG. This involved a partnership between CIC and the Ministry of Education. The idea was to integrate coffee growing lessons into the regular school curriculum, consequently providing vocational training to a new generation of coffee farmers in the nation. Thus, students would be able to leave school with sufficient knowledge and skills for self employment in the coffee industry or with increased chances of employment in the industry.

Main activities:

1. Helping teachers with the Coffee Curriculum (content and pedagogy)
 - Prepare In-Service Plan by CIC & Partner Staff
 - Prepare In-Service Package by Resource Persons
 - Deliver the In-Service programs
 - HIV/AIDS Education and Awareness to be an integral part of In-Service Programs
 - Gender-Based Affirmative Action Integral to In-service and Education programs
2. Assessment of Coffee Curriculum (content and pedagogy)
 - Design of Coffee Curriculum Assessment Instrument

BOX 9.5. *Continued*

- Assessment of the Coffee Curriculum
- Analysis of Assessment Results/ Reports
- Editing and Printing of Second Edition

3. Coffee Establishment in Schools

- Nursery Establishment (School Term One)
- Rehabilitation (School Term Two)
- New Planting (School Term Three)
- Processing & Marketing (School Term Four)

Roles of different partners: The Research and Grower Services Division of CIC was responsible for or mandated to carry out the following: research, extension, education, and smallholder linkages and mobilisation. It was also responsible for coffee production, processing and marketing. The National Department of Education was responsible for developing, implementing and evaluating the impact of all curriculum material, including agriculture, in the school system in Papua New Guinea.

Outcomes:

The Coffee Curriculum project is playing a crucial role in promoting coffee culture in PNG through a non-traditional partnership between the Ministry of Education and CIC. The partnership aims at providing vocational training targeted at Grade 8, 10 and 12 school leavers, creating a new generation of coffee farmers in the nation. The curriculum provides skills development and allows coffee farming and marketing to be taught as a school subject, enabling students to graduate with skills, knowledge and basic experience to take up coffee farming as a livelihood option. The project uses schools as a vehicle and teachers as agents of change. Each year, an estimated 14,000 students take coffee curriculum classes. A total of 10 schools in different provinces are currently involved in this project.

Source: Authors

to development. By focusing the call as cross-sectoral, ASSC sought to demonstrate that promoting innovation in and around agriculture was a viable way of approaching development and achieving national level goals. This, of course, was also an important principle to establish if AIGS was to lay the foundation for a national grants scheme.

BOX 9.6. ILLUSTRATION OF AN INNOVATION PROJECT FROM CALL 4

Project title: Innovative and farmer-led backyard gardening initiative to strengthen food security and improve nutrition for farming households and children in five villages of Rigo District, Central Province

Lead Organisation: Child Fund

Partner Organisations: Fresh Produce Development Agency (FPDA) and National Agricultural Research Institute (NARI)

Budget: K143,671 (approximately US \$69,394). Amount utilised: K71,836 (approximately US \$34,697)

Rationale: The project proposed to increase food security, household income and address nutrition-related deficiencies and improve health of smallholder farmers, children and families by demonstrating innovative, improved agricultural practices and technologies. It created access to relevant information for farmers in the targeted villages. One of the key elements of the project was the strengthening of backyard gardening as most farmers depended on out-fields that were far from their villages. The project also targeted women and children. Fresh, nutritious food could mean tackling malnutrition among children aged 0 to 5 years.

Main activities:

- Establishment of backyard gardens in five villages and six demonstration schools
- Establishment of poultry units in the five villages and six demonstration schools
- Backyard garden training: Step-by-step training on management and care of crops, from land preparation to field management, marketing and gross margin calculation from cash crops
- Training on nutrition, food processing and preservation aimed at raising awareness on nutrition deficiencies. This involved 36 mothers and caregivers
- Poultry training to address management practices, including marketing and financial management
- Addressing gender HIV/AIDS issues in all training and other project activities

Roles of different partners:

Child Fund

- Liaising with the Community Development Committee to ensure people's participation. CDC reports back to the community for ownership

BOX 9.6. Continued

and commitment.

- Liaise with other partner organisations (FPDA and NARI)
- Responsible for overall implementation at the project sites

FPDA

- Deliver training on gardening and establishment of demonstration backyard gardens
- Provide planting, technical supports, materials and tools

NARI

- Provide improved technologies, including know-how and technical support

Outcomes:

- Farmers were introduced to new ways of improving their food and nutrition security
- Knowledge on processing and preserving of food from safety and nutrition points of view
- Increased availability of nutritious meals for mothers and children
- Better understanding of the wider context that affects farmers' livelihoods. For instance, market access, including infrastructure
- Improved services to rural people through partnership among research institutes, community based organisations and NGOs
- Inclusion of women and children through community partnership and ownership of development activities

Source: Authors

The call received a good response, with 162 concept notes being submitted. The patterns of organisations that led and partnered in the approved projects once again illustrated that AIGS was stimulating significant institutional innovation in the delivery of services to smallholders. The projects themselves illustrated an interesting diversity of types of innovation and showed real promise of improving production and livelihoods of small farmers. Boxes 9.5, 9.6 and 9.7 illustrate three of the projects funded under the fourth call. The demonstrated ability of AIGS to target specific regions and to use agriculture as an innovation entry point for tackling more broad-based development issues was pivotal in leveraging negotiations for a national grants scheme.

BOX 9.7. ILLUSTRATION OF AN INNOVATION PROJECT FROM CALL 4

Project Title: Opportunities for Coconut Smallholders

Lead Organisation: Tropic Frond Oils Limited

Partner Organisation: Bitakokor Co-operative and NARI

Duration: 1.5 years

Budget: K205,755 (approximately US \$99,380)

Rationale: This project set out to ensure a viable and sustainable future for smallholder coconut production through participation in an enhanced value added chain in Gazelle Peninsula. Copra is the main income generating activity in the region, and is also grown to be consumed at home. Smallholder copra is usually produced only once or twice a year, and farmers face problems of low yields, poor quality, high overheads, poor profitability and low farmer motivation. Tropic Frond Oils has developed a range of high-value products using virgin coconut oil. Quality control starts at the block to ensure a supply of undamaged non-germinating coconuts capable of producing quality oil. The high value of the product and the need for stringent raw material quality control means that a significantly higher price is paid for the whole husked coconut than the farmer would achieve after conversion to copra. This, coupled with free transport, makes coconut harvesting more lucrative than other traditional alternatives currently available to smallholders.

Main Activities:

1. An integrated smallholder extension program to produce quality coconut raw material for the manufacture of high value finished products.
 - Coordination between growers, drivers and production managers to ensure freshly husked nuts are delivered as per the daily supply plan
 - Replanting of new blocks and infilling
 - Mapping as part of the organic certification process required by the international market
 - Training
 - Organic certification
2. A desiccant drying process ensures the production of the highest quality coconut oil.
3. Provision of farm tools with transport subsidy.
4. Processing of coconut
5. Production packaging, labeling and marketing
5. Information gathering through literature review
6. Gender and HIV/AIDS issues

BOX 9.7. Continued

Roles of different partners:

Tropic Frond Oils Limited

- Co-ordinates the rural extension program
- Provides transport to collect coconuts directly from smallholder blocks
- Purchases all quality coconuts from co-operative members
- Increases drying capacity thus increasing the demand for coconuts by installation of a solar powered liquid desiccant drying system
- Technical input into the literature review in developing guidelines
- Dissemination of the completed literature review to universities and research institutes, food manufacturers, pharmaceutical companies, competitors
- Re-writing chapters as press releases, publishing and distribution to print and electronic media, health-food importers and retailers

Bitakokor Coffee Co-operative Limited

- Assists in coordinating the smooth marketing, supply and quality control of coconuts to the processor through the appointment of a village-based smallholder liaison officer
- Provides in-field transport by operating a wheelbarrow pool. Funds raised will be used to purchase private wheelbarrows for members.
- Co-ordinates short courses to be developed and presented by the University of Natural Resources and Environment's (UNRE) Integrated Agriculture Training Program. Themes include economic analysis of smallholder activities and time management and motivation.
- Bimonthly meetings to be used as forums for discussion and personal advice on themes such as HIV/AIDS, reproductive health and family planning, with the help of staff from the health department and NGOs

NARI

- Provides a research institute with an industry relevant focus
- Provides a private sector manufacturer with access to high grade research
- Conduct a literature review on the subject in partnership with Southern Cross University
- Publish the review in a suitable international scientific journal

Outcomes:

The project has resulted in increased incomes from the production and manufacture of body, hair and cooking oils from coconuts. They also plan to produce and sell coconut juice in the future. Villagers see the direct benefits from a fixed coconut farm gate price and are also happy as they do not need to dry coconut for copra and sell at inferior and often fluctuating prices. The project has strong people-oriented programs and provides a reliable market for products. It also helps farmers get organic certification and ensures good prices overseas.

Source: Authors

TURNING AIGS INTO A NATIONAL COMPETITIVE AGRICULTURAL INNOVATIONS GRANTS SCHEME

AIGS was launched alongside the national agricultural development plan (NADP), which had a lot more funds to disburse⁷. In the initial stages the Department of Agriculture and Livestock (DAL), which was responsible for the NADP, believed that it was preferable for AIGS funds to be merged with NADP funds to avoid what appeared to be a duplication of effort — and, by doing so, increase the potential for impact. It was argued that the predecessor to AIGS (AIGF) had run a fragmented grants scheme that failed to deliver impact at scale. However, ARDSF held the view that the AIGS design had specifically laid emphasis on developing and piloting a competitive grants scheme as a potential novel funding mechanism to catalyse agricultural innovation among smallholder agricultural producers. It was anticipated that, should other funding agencies find the funding mechanism convincing, they would either build on it or borrow from it to form a national agricultural competitive grants scheme. To ensure effective communication among all actors, the governance system of ARDSF — and AIGS in particular — incorporated representatives of all key stakeholders in the PNG agricultural sector, including DAL.

Following the successively improving delivery of the first three AIGS calls, the agriculture sub-committee of the Consultative Implementation and Monitoring Council (CIMC)⁸ requested a concept note from AIGS to initiate the process of turning it into a National Agricultural Innovations Grant Scheme (NAIGS). The concept note was presented to CIMC and endorsed in principle.

To develop a further understanding of the concept note and to seek broader feedback from key stakeholders, the CIMC nominated a sub-committee representing key stakeholders⁹ in the PNG agriculture sector. This committee was charged with the responsibility of working with the ARDSF Secretariat to deliver the following:

⁷ Initially NADP dedicated K100 million (approximately US \$ 48.4 million) per year for agricultural development in PNG. After a while, these funds were rechannelled to other agencies for distribution due to various management challenges.

⁸ CIMC meeting held on June 30, 2010.

⁹ Department of Agriculture and Livestock (DAL), Department of National Planning and Monitoring (DNPM), Rural Industries Council (RIC), National Research Institute (NRI) and Commodity Boards (represented by Coconut Industry Corporation).

1. Evaluate the AIGS and similar competitive grant schemes to arrive at options that best suit PNG's context
2. Provide at least two possible models that clearly demonstrate robustness and integrity by competently addressing the issues of governance, financial sustainability and management and operational and procedural management
3. Present the possible models to the CIMC Agriculture Sectoral Committee for discussion, comments and endorsement
4. Meet with senior management of key government departments, including Planning, Treasury, Prime Minister's Department and the lead government department responsible for the Agriculture sector, the DAL, to get their views on the endorsed model, including the institutionalisation of a National Agriculture Grant Scheme
5. Meet with other development partners to get their views and endorsement of the model, including on the institutionalisation of a National Agriculture Grant Scheme
6. Prepare a National Executive Council (NEC) Submission for the Minister of Agriculture and Livestock to table the proposed National Competitive Agriculture Grant Scheme (NCAIGS) for endorsement

The NCAIGS is intended to serve as a funding mechanism to catalyse the transformation of the agrarian PNG society. The funding base will include the PNG government, the private sector, and the donor community. The scheme is expected to build from the experience of the AIGS. Under the stewardship of the ASSC, the Secretariat of the AIGS has developed and tested systems and processes to initiate, plan, implement, monitor and evaluate grants. The following are examples of the tools developed to manage AIGS grants (details can be seen in the technical annex):

- Expression of Interest guidelines with formats: these are used to provide guidance in developing concept notes as a first step in the application process
- Project proposal form: these are used to guide development of full proposals
- Grant Agreements: these provide the “rules of the game” for the implementation of the approved projects
- Monitoring and Evaluation guidelines: these provide the framework upon which project implementation is reported and corrective measures taken on a regular basis
- Impact Assessment guidelines: these provide the framework upon which formal assessment of the delivery process is made

In its four years of operation, AIGS disbursed and managed 33 projects in all provinces of Papua New Guinea. It is expected that the NCAIGS would continue to utilise research and development capacities of government and non-government organisations to deliver services, especially to smallholder agricultural producers, to deliver PNG Vision 2050¹⁰.

The adoption by the government of PNG of the AIGS model for its national competitive grant scheme has been part of the proposed development of a new sort of policy instrument, the National Agricultural Innovation Facility (NAIF). If this does indeed come to fruition, the AIGS will have succeeded in catalysing a major institutional innovation in the way agricultural services are delivered to farmers and in the way agricultural innovation is used to achieve national development goals.

LESSONS

AIGS holds many operational and policy lessons for those designing competitive funding mechanisms to support innovation as part of the AR4D approach. These include:

- The importance of creating operational space to experiment with and incubate a novel form of innovation grants scheme. This helps develop workable institutional arrangements that are fit-for-purpose and provide proof of principle that can be leveraged in wider policy debates.
- The importance of ensuring that all key stakeholders fully understand the idea of innovation and the wider paradigm implications of AR4D and the implications this has for the design and operation of an innovation grants scheme.
- The value of evaluations of other funding schemes as a way of legitimising the adoption of challenging new institutional arrangements.
- The importance of conceiving and operating the scheme as a way of stimulating agricultural production, process and marketing

¹⁰ "We will be a smart, wise, fair, healthy and happy society by 2050". GoPNG (2009).

innovations, as well as innovations in the delivery of services. This means supporting new ways of working by sector stakeholders.

- The importance of having a clearly articulated purpose of the scheme that specifies how it will impact on the livelihoods of smallholders.
- The importance of scoping each successive funding call.
- The importance of tailoring funding calls to themes that will allow a scheme to demonstrate its wider utility beyond the agricultural sector as a policy instrument that can contribute to national development plans and goals.
- The importance of developing institutional arrangements that make the scheme responsive to the changing development agenda.
- The importance of an iterative approach to funding, learning from the experience of earlier calls and adjusting future calls accordingly.
- Related to this is the importance of staffing grant schemes with personnel who have the right skill mix to support an AR4D orientation. It might also be necessary to provide staff space to “learn by doing” as there is no manual available for many of the tasks they are likely to encounter.
- The importance of focusing calls on identifying innovation opportunities and then structuring support and partnerships around these opportunities. As some partners will be new to the world of proposal development (particularly non-traditional partners) considerable technical support needs to be provided in proposal development.
- The importance of robust result frameworks and M&E arrangements to ensure that innovation grant schemes focus and continue to focus on higher-order development objectives that have been set for them.

There are also pitfalls that are best avoided.

- Inheriting institutional arrangements from technology transfer grant schemes places an extra burden on the institutional development of innovation grant schemes. Personnel with experience in technology

grants schemes are probably best avoided, although this can sometimes be difficult.

- Avoid the temptation to issue calls before at least basic institutional arrangements have been put in place. Donors should note that the imperative to spend money quickly may well undermine the ability of the grant schemes they are supporting to achieve their purpose.

TECHNICAL ANNEX

PRINCIPLES AND ASSUMPTIONS IN THE ARDSF SCOPING FRAMEWORK

- a. Responsive to client and stakeholder needs and market demands.* The agenda of AIGS projects was demand-driven and based on the needs of stakeholders along the value chains (from production to consumption), particularly smallholder producers. This meant that it was critical that AIGS accessed information on the needs of various clients and stakeholders. Such information was generated from studies commissioned by AIGS or through the efforts of complementary activities. For the purpose of the AIGS, agreement was reached on a broad definition of “innovation” to include technologies, institutions and policies along the value chains and/or development domains.
- b. Alignment to sector and sub-sector development objectives.* AIGS had to complement and be aligned with the objectives of the national agriculture sector and sub-sector development plans including: the PNG Vision 2050, Medium Term Development Plans, the National Agriculture Development Plan and sub-sector development plans focusing on individual commodities and factors. AIGS strived to support these broad development objectives by targeting resources into priority thematic areas as identified by the ASSC and supported by the ARDSF Management Committee.
- c. Value chain mapping and targeted investments.* Value chain mapping defines relationships among various players and the trigger points that may unlock value along the chain. Such trigger points constituted potential thematic areas for focusing AIGS investments and, it was hoped, mobilisation of the critical mass necessary for impact.
- d. Linkages and partnerships.* Given the complexity of social transformation upon which desired people-level impact is premised, the need for collective action cannot be over-emphasised. It was understood that the root of effective collective action was partnerships and linkages among diverse actors with shared aspirations. AIGS, therefore, encouraged appropriate partnerships that delivered impact at the people level. Such partnerships included the public sector,

private sector, non-governmental organisations, and community based organisations.

- e. *Scale of investments.* Given the limited size of AIGS funding¹¹ it was understood that the relatively small projects would most likely deliver impact at pilot level. To increase chances of upscaling impact, it was decided that the scheme would earmark specific amount of resources to priority thematic areas. Thus, it was envisaged that related projects within and among respective calls would deliver impact at scale.
- f. *Balance between income generation and food security.* Improved livelihoods for smallholder farmers in PNG would depend on household food production as well as income generation. It was evident from the global trends in food shortages and the corresponding increases in food prices that this issue would remain current for a long time. AIGS decided to aim for a balance between the two objectives — food security and income generation.
- g. *Building on previous investments and lessons of past work.* AIGS built on previous investments and lessons from past work, with a view to generating synergy and sequential logic necessary to attain long-term objectives from short-term project-based investments. Examples of past investments included previous competitive grants projects; research work by the NARS organisations; and previous investments in agriculture by the government and private sector.
- h. *Ability to leverage resources.* Whenever possible, AIGS projects sought to leverage additional resources from related initiatives. This proved pivotal in determining whether proposed initiatives would be sustainable in the long run. On the basis of this, potential funders may be engaged in the development of the envisaged NCAIGS as an off-shoot of the AIGS.
- i. *Cross-cutting issues.* It was appreciated that women constituted the bulk of agricultural producers in PNG, and that HIV/AIDS posed one of the biggest threats to agricultural sustainability. Thus addressing these two issues was identified as critical to the success of the AIGS. Therefore, all proposed projects needed to demonstrate the extent

¹¹ Up to K250,000 (approximately US \$120,751)

to which they had taken the two issues into consideration in project design, budgets and monitoring and evaluation systems.

- j. *Sustainability of AIGS*. It was appreciated that the key to AIGS's sustainability would lie in its expected outcomes: supporting agricultural innovations for improved productivity and related incomes and food security; establishment of a national grants scheme for PNG; improved performance of agricultural research and extension organisations, including both government and non-governmental agencies; and gender and HIV/AIDS mainstreamed through AIGS activities. Thus, while efforts were made to ensure that each of the funded AIGS projects would be addressing sustainability issues, the overall management of the scheme also aimed at delivering relevant elements of sustainability for AIGS.

TOOLS OF THE AIGS

- Expression of Interest guidelines with formats: These were used to provide guidance in developing concept notes as a first step in the application process. The expressions of interest were screened by the technical appraisal and advisory panel (TAAP) on the basis of pre-set criteria and consistent with the prevailing thematic call. TAAP recommendations were considered by the ASSC. Approved Expressions of Interest were also developed into full proposals.
- Project proposal form: These were used to guide development of full proposals. Again, the proposals were screened by the TAAP on the basis of pre-set criteria and consistent with the prevailing thematic call. Those recommended for funding were approved by the ASSC and managed by the Secretariat.
- Grant Agreements: These provided the “rules of the game” for the implementation of the approved projects. Respective leaders of the approved projects were required to sign grant agreements with the ARDSF Secretariat. The agreements consisted of both key technical aspects and financial obligations based on the AIGS grant guidelines. Project implementation began upon exchange of signatures.
- Monitoring and Evaluation guidelines: These provided the framework upon which project implementation was reported and corrective measures taken on a regular basis. These included back-to-office reports, quarterly reporting formats (both technical

and financial reporting), mid-term review guidelines, and project completion reports.

- Impact Assessment guidelines: These provided the framework upon which formal assessment of the delivery process was made. This was usually done the following year after completion of the project. Most projects ran for two years. Impact assessments were also scheduled to review particular calls or a series of calls. This enabled assessment of cumulative impact of the overall AIGS program.

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Facilitating the Development of the ARDSF Theory of Change

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INTRODUCTION

This chapter is about the process of developing a theory of change for ARDSF and the role of this in establishing its monitoring and evaluation (M&E) system. It highlights the characteristics of an M&E system required by the broad-based, systems-inspired AR4D approach to capacity building in a national agricultural research system (NARS). The chapter describes the rationale of such an M&E system and its different, particularly the development of a results framework that linked new capacity to national level goals of agricultural productivity and rural prosperity. Since this framework articulated impact pathways, its development was used as a planning tool and as a way of managing performance of the implementation

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of these plans, as well as an accountability tool. The results framework provided a point of reference for other elements of the M&E system. These included a performance framework for the ARDSF implementing contractor, an internal impact evaluation review and an independent progress review. The process of developing the M&E system, particularly the results framework, required considerable consultation and negotiation about the nature of results expected to be delivered; and about the timeframes and responsibilities for achieving and measuring socioeconomic impacts. This chapter describes these different elements and the process of developing and negotiating them. It also describes the main tools used and highlights lessons for those developing and implementing these systems.

M&E IN AR4D

There are two important features of AR4D that have implications for monitoring arrangements. The first concerns its focus — specifically on addressing the needs of smallholder farmers. An AR4D orientation specifies that this is not a rhetorical ambition, but that impact pathways to achieve this are clearly articulated and that activities are monitored and made accountable to this objective.

Yet, because AR4D recognises that impact arises from an integrated set of activities, partnerships, strategies and policies, monitoring and evaluation systems need to be designed in such a way that allows the effectiveness of individual component parts to be understood as part of a greater whole. This chapter explains the way ARDSF adopted an approach where planning, monitoring and evaluation (PME) were designed with this integrated vision of impact pathways in mind. Key here was the cascading logic of a results framework, which positioned activities at different levels in a hierarchy of objectives linked to a higher-level objective of improving food security and smallholder prosperity

The second feature of AR4D concerns its reliance on systems perspectives (although the integrated approach to impact is also inherently systems-inspired). Of central importance in these perspectives is the idea that ways of achieving results cannot be designed in advance other than in fairly generic terms. This is partially because it is rarely possible to predict the range of changes needed to achieve success. So, for example, projects seeking to develop a market chain for agricultural products produced by women's groups

might start off with training in process techniques and seeking partnerships with export companies only to find that transport costs and pricing policies are too high. This might mean the need to engage with new policy partners to try and relieve bottlenecks, or it might mean renegotiating prices with companies.

The systems perspective of AR4D address this uncertainty by adopting a learning-driven approach where interventions are seen as experiments with a view to learning how things can be done better. This is not just because ways of achieving results are difficult to plan, but also because the environment in which these interventions are made is constantly changing. For example, the world price for an export commodity may suddenly drop, or there might be a new pest outbreak. This uncertainty, and the need for constant learning by doing, means that monitoring is the key way in which information is generated on the effectiveness of projects. In other words monitoring is the way projects learn and make mid-course corrections. The focus of this monitoring is as much concerned with how things are done (institutional factors) as with the outcomes that are achieved (Hambly, Hall and Dorai, 2012).

Another dimension of the systems perspective of AR4D — and again this relates to the integrated view of impact pathways — is that these different ways of doing things mean changes at multiple levels. At the level of the farmer, at the level of organisations in the research and extension system (and among their development partners) and at the systems level, and the institutional arrangements and policies that affect how this system operates.

This chapter explains how indicators of institutional changes at multiple levels within the NARS in PNG were needed to track their progress in the process of capacity building. The chapter illustrates how this was used to drive the learning by doing approach of ARDSF.

ARDSF'S THEORY OF CHANGE

To understand the development of the M&E system in ARDSF, it is useful to recap the different components of the facility and its underlying theory of change — in other words its assumptions about the way a chain of events will link its activities with its purpose (what ARDSF must deliver) and its goal (what ARDSF's purpose must contribute to). The starting point is ARSDF's purpose. This was stated as follows:

To enable selected national agricultural research and development organisations to deliver improved services to their selected stakeholders

It is important to note that this is a capacity building purpose and it was articulated with the understanding that an essential element of this new capacity concerned the emergence of a national agricultural research system where research and development organisations worked together and were linked and responsive to farmers, other developments actors and policy-makers.

This purpose was, in turn, designed to contribute to the achievement of ARDSF's goal:

To achieve higher income and maintain food security of farmers of rural smallholders in PNG

It is important to note here that ARDSF was not responsible for delivering these national level impacts articulated in the goal, but merely to help create the conditions (capacities) whereby these could be achieved by the wider efforts of the government of PNG, the market and farmers themselves. However, ARDSF was responsible for creating the capacities in the NARS organisations (its purpose) to contribute to these national level goals. It was, therefore, responsible for monitoring (not evaluating) to see if new capacities were indeed being built and that there was a likelihood that these would contribute to achieving farm level outcomes. In practice, as we shall see, this meant monitoring new ways of working within and among the NARS and exploring socioeconomic impacts of new activities piloted by the NARS organisations as a result of these new ways of working.

To achieve its purpose ARDSF relied on the collective outcomes of three components.

Component 1. Institutional and capacity development of the National Agricultural Research Institute (NARI) supported by a core grant.

Component 2. Institutional and capacity development of selected NARS organisations:

- Cocoa and Coconut Institute (CCI)
- Coffee Industry Corporation (CIC)

- Fresh Produce Development Agency (FPDA)
- National Agricultural Research Institute (NARI)
- Oil Palm Industry Corporation (OPIC)
- Oil Palm Research Association (OPRA)

Component 3. Pilot scale service delivery through an Agricultural Innovation Grants Scheme (AIGS), laying the foundation for a national competitive grants scheme.

A cross-cutting fourth component was the use of gender mainstreaming and HIV/AIDS awareness as a planning, operational and monitoring tactic to ensure that service delivery was targeted at the most socially disadvantaged groups.

The theory of change of ARDSF is, therefore, that: once appropriate organisational capacity is built, it would in turn trigger more appropriate products and services, which in turn would trigger more widespread adoption of technologies and associated processes of innovation, which in turn would trigger increased productivity and environmental health, consequently leading to income gains and food security.

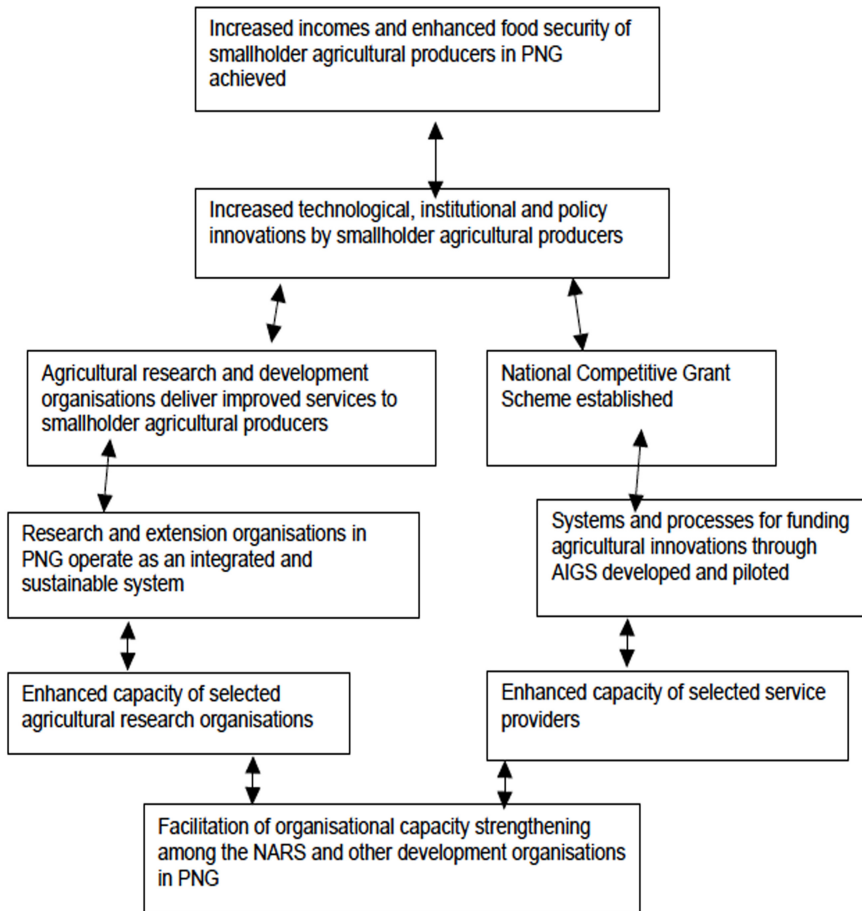
Figure 10.1 illustrates this theory of change.

CHALLENGES OF DEVELOPING AN M&E SYSTEM FOR ARDSF

There were a number of challenges in developing an M&E system for ARDSF and the program spent considerable time debating these. The theory of change outlined above was complicated. Partially, this was because it had a number of components, the activities of which would deliver outputs that together would deliver the purpose. While this is not entirely unusual in intervention design, the fact that these different components needed to add up to a sum greater than their parts presented a challenge in terms of how to monitor this collective capacity.

The theory of change was also complicated in that it contained a large number of links in its impact chain. This led to considerable discussion within ARDSF, with its NARS partners and with its donor about responsibilities for delivering results along that impact chain. Pivotal to all this was a discussion about whether ARDSF should be responsible for delivery of new capacities or

FIGURE 10.1. ARDSF'S THEORY OF CHANGE



Source: Authors

for better delivery of services to stakeholders. The adopted AR4D orientation emphasised farm level outcomes, but quite clearly there was going to be a time lag between capacity building efforts and results on the ground.

The adoption of AR4D as a framework to help the NARS bridge their own operational gaps between what they were doing and what they wanted to achieve at the farm level brought its own challenges. Key here was the

challenge of the needs-driven, learning-based approach, which meant that ARDSF could not predict in advance what precise actions the NARS capacity building approach would entail. While the ARDSF design offered these broad outlines of expected results in each component, the facility was expected to engage key actors at all levels to negotiate concrete deliverables and facilitate the development of the necessary delivery processes.

As a result, the development of the ARDSF M&E system had to be preceded by a systematic planning process at different levels of operation to define what capacity building would actually entail. From this planning process (described in chapters 5, 6 and 7) emerged a cascading results framework that laid the basis for an M&E system. Figure 10.2 illustrates this cascading logic. This process was characterised by great controversy because key actors were familiar with simpler forms of M&E processes that addressed less complex project-level operations at specific units of analysis: for example, research projects were monitored in terms of research results; extension activities were monitored in terms of farmers visited, etc. ARDSF's M&E system needed to track how its efforts were allowing these different sorts of activities by the NARS organisations to collectively achieve impact.

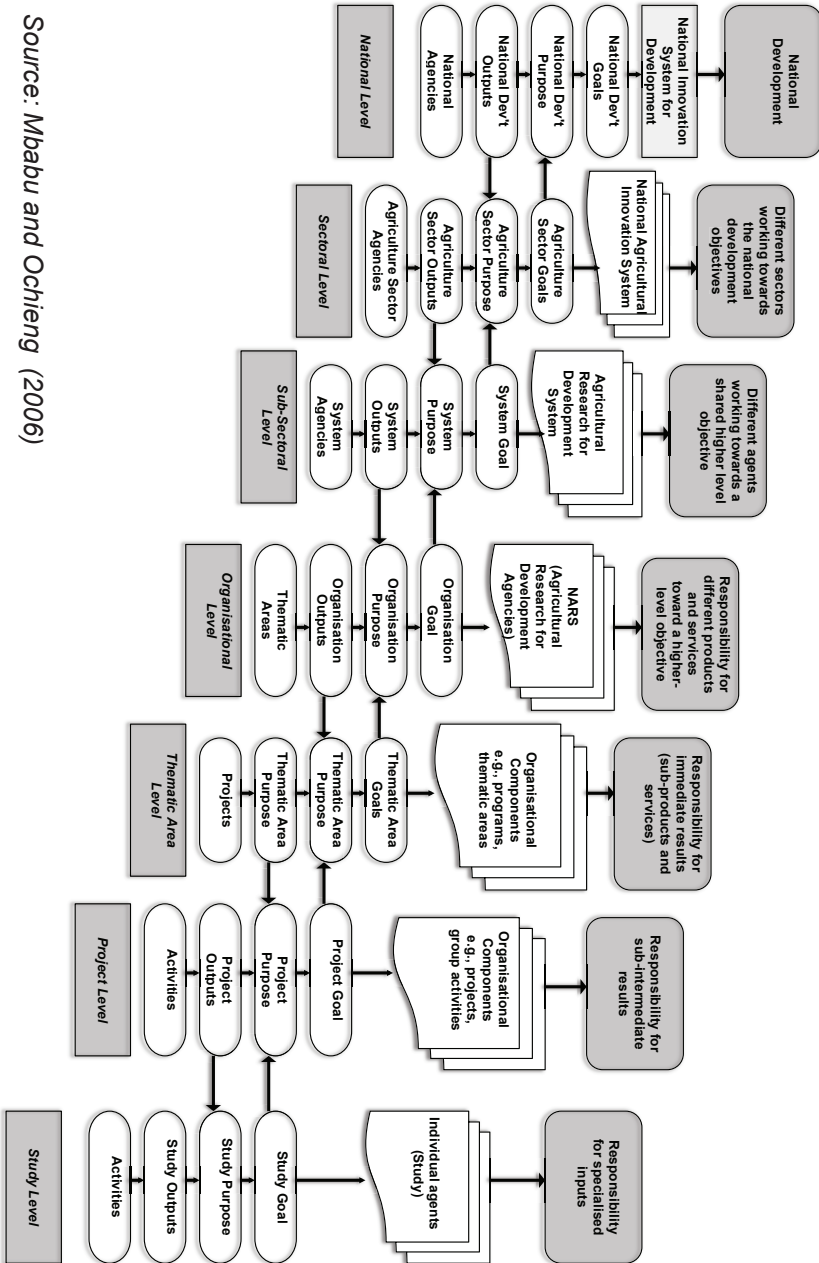
In designing its M&E system to accommodate the AR4D process-driven approach, ARDSF had to ensure the system had built-in flexibility in terms of its reporting milestones and its use of resources. This flexibility sat uncomfortably with bureaucratic practices in the NARS, but also with the ARDSF managing contractor and with the donor. This meant that the M&E approach had to be negotiated.

CONSULTATIONS AND DISCUSSION ON THE ARDSF M&E SYSTEM

To ensure that the M&E system would support the learning-by-doing needs of ARDSF, extensive consultations were undertaken with the NARS organisations. The following illustrates the sorts of issues raised in these discussions and the resolutions reached:

- How to align the development of the M&E systems within individual NARS organisations with that of ARDSF? This was highlighted as a special case with some of the NARS receiving a different form of assistance than others. It was recognised that this alignment was

FIGURE 10.2. CASCADING LOGIC: A FRAMEWORK TO ORGANISE AGRICULTURAL R,D&E AGENCIES TO DELIVER RESULTS FOR IMPACT AT SECTOR/SOCIETAL LEVELS



Source: Mbabu and Ochieng (2006)

necessary, although challenging.

- It was also necessary to resolve the question about whether ARDSF's responsibility would be in monitoring the impact performance of the specific projects funded (either associated with the organisational development process under component 2 or through the competitive Agricultural Innovation Grants Scheme under component 3) or whether these should be monitored in terms of the extent to which these were new ways of working that organisations had adopted in pursuit of higher-level development objectives.
- In the case of projects that would emerge from component 2 and 3, part of the problem was that an M&E system would need to anticipate projects that would emerge from a needs assessment process and competitive calls.
- In the case of the competitive grants component it was recognised that what needed to be monitored was not the impact of individual projects, per se, but how effective the grants scheme was in terms of supporting capacity development activities under other components of organisational development and their ambition for impacts — and how effectively it was targeting promising technology and innovation processes with the potential for greatest impact at the people level.

To facilitate this, the ARDSF M&E advisor developed a generic results framework to attract attention to higher-level ARDSF objectives and, in doing so, generate debate among the participating NARS. The advisor subsequently engaged each of the participating NARS organisations to reach a common understanding on the way forward. It was felt that such an understanding was likely to be more meaningful after the needs assessment process was concluded, as this would have involved developing a results framework for each organisation that would articulate the impact pathways that needed to be developed.

The needs assessment process identified areas of capacity building to ensure improved services — and that were more likely to deliver impact. Results frameworks were developed as part of program development — visualising what needed to be achieved at what level and what organisational capacity was required for effective delivery at respective levels.

The M&E advisor subsequently distributed a revised framework for comments. The following issues were raised in response to this framework:

- i. The framework needed careful analysis of cause and effect relationships. For example, the overall objectives needed to be clear: Goal and Purpose; their respective indicators of success and the means of verification also needed to be established. It was expected that the goal of ARDSF would resonate with the PNG Medium Term Development Strategy (MTDS) (GoPNG, 2010) — this was broadly articulated in terms of livelihood improvements; and that the purpose would resonate with the National Agriculture Development Plan (NADP) objective (DAL, 2007) — better support and services to smallholder farmers and increased agricultural production. Therefore, both indicators of success would need to be monitored at the more aggregate national level (national statistics).
- ii. Once that was clarified, it was possible to pose the next series of questions: what were the necessary and sufficient conditions to achieve the purpose? The answers to that question consequently suggested necessary deliverables to achieve the purpose. With the deliverables determined, then corresponding indicators of success needed to be determined and the means of verification established. Considering that ARDSF's entry point for Components 1 and 2 was institutional development, it was necessary to follow impact pathways set out in the theory of change introduced earlier.
 - a. ARDSF capacity building interventions
 - b. Improvements in the NARS organisational capacity
 - c. NARS (and partners) service delivery (products and services)
 - d. Agricultural production processes: adoption of technologies and related innovations
 - e. Productivity and environmental gains taking account of gender and HIV/AIDS considerations
 - f. Income and food security gains taking account of gender and HIV/AIDS considerations

It was expected that the last two elements of the impact pathway (*e and f*) would form the super-goal (MTDS) and goal (NADP) levels, thus suggesting longer-term horizons. It was further expected that element *d* would be an indicator at the ARDSF purpose level; and that lower level elements (*b and c*) would be ARDSF outputs, in collaboration with the NARS. In other words,

ARDSF deliverables would be in the earlier stages of the impact pathway, and through the NARS and their partners results further down the impact pathway would be delivered.

It was necessary to engage the NARS organisations in the development of the framework discussed above as this was an integral part of their own management systems. To support this it was decided that a local M&E advisor be recruited with a remit to engage the NARS on a regular basis. This was done under the guidance of an internationally recruited M&E advisor. The employment of a local M&E advisor had not been anticipated in the ARDSF design and resources needed to be reallocated to this activity. Further, in order to develop a culture of “Managing for Results” in the entire ARDSF initiative, it was decided that the process of developing results frameworks would focus on both training-of-trainers and developing component specific frameworks.

UNEXPECTED RESULTS OF DEVELOPING THE RESULTS FRAMEWORK

The process of developing results frameworks at different levels of operation was confusing and even controversial. However, the process of developing the framework had a number of unexpected benefits.

- It helped clarify many grey areas in the ARDSF design and the corresponding scopes of work for ARDSF contractor who had the responsibility of managing the day-to-day activities of the facility.
- It helped develop necessary conceptual understanding among ARDSFs principal actors of what it would take to deliver expected results.
- It laid a basis for an operational M&E system for Components 2 and 3.
- It imparted necessary skills among the ARDSF principal actors to lead the NARS towards a results-oriented organisational culture.

FROM RESULTS FRAMEWORK TO MANAGEMENT TOOL

After extensive consultations, it was agreed that the ARDSF results framework would be developed into a management tool, consisting of the following key elements:

- a) Objectives and indicators of success
 - Hierarchy of objectives using cascading logic
 - Key indicators of success at each level: serving as observable and verifiable indicators (OVIs) for M&E
 - Means of verification for each M&E indicator
 - Assumptions (if any) for M&E indicators
- b) Integral parts of the decision-making processes
 - Reporting responsibility at each level
 - Reporting formats at each level: beginning from the bottom and aggregated to respective levels
 - Reporting time frames for respective levels of operation: more frequently from the bottom upwards
 - Feedback processes at respective levels of operation
 - Appropriate management information system (MIS) to support information sharing

Consequently, under the leadership of the facility manager, the ARDSF team developed the top three logframes of the cascading logic: overall ARDSF logframe; Component 2 logframe; and Component 3 logframe. Advisors from ARDSF were tasked with the responsibility of drafting respective logframes for the thematic areas they were committed to lead. These drafts were developed in consultation with the respective institutional working groups (IWGs) of the NARS organisations. In taking this approach, it was understood that the facility manager had taken overall responsibility for delivering and reporting on the ARDSF results; and similarly, component coordinators had taken responsibility to deliver and report on component-specific results. Thematic advisors took upon the responsibility of delivering and reporting on thematic results in collaboration with the IWGs. The calendar for reporting on the respective levels was subsequently agreed among all actors.

As part of AusAID oversight, an independent consultant was invited to comment on the draft ARDSF M&E framework. However, the consultant declined to assess the framework on the grounds that it was based on a cascading logic that he believed was inherently flawed. The consultant preferred using the “onion skin” model that allowed “multiple log-frames at each level of operation”. Asked to elaborate on how the “onion skin” model would work for the ARDSF, the consultant attempted to condense the facility goal, purpose and outputs to those of the respective components and sub-components. In other words, in the “onion skin model” each unit of analysis would be held to account for the same goal and purpose irrespective of their

respective levels of operation. Thus, an individual promises to deliver what a team would; or a team promises to deliver what an organisation would; or an organisation promises to deliver what the whole sector would. In this condensed notion of accountability the concept of “impact pathway” that differentiates deliverables at different levels of operation would be lost; consequently undermining the anticipated culture of “managing for results”.

Ironically, the version of the cascading logic used in the ARDSF results framework also entails multiple logframes at each level. The only difference is that in the ARDSF model, the cascading logic requires each lower level logframe to be “hooked” to a shared higher level objective. This condition allows for collective action, which is an essential element of the AR4D orientation.

In the case of ARDSF, Component 1 supported NARI to deliver its mission, with a caveat that the institute would need to develop an M&E system to enhance management of the delivery process. Component 2 supported six research and extension organisations in the way they respectively deemed necessary to improve their services. Out of this generic provision, eight thematic areas were identified through needs assessment processes as key to capacity development. Component 3 consisted of a grants scheme to catalyse agricultural innovation processes for the benefit of smallholder agricultural producers.

ARDSF was, therefore, a flexible facility to orchestrate different but related innovations necessary to deliver improved services, and ultimately increase incomes and food security for smallholder agricultural producers.

Thus, the cascading logic helped to translate broad development objectives into intermediate results that would be delivered by the respective ARDSF components, and subsequently by the thematic thrusts within the components.

Finally the cascading logic facilitated development of a widely owned results framework by key stakeholders among the NARS organisations, the ARDSF Secretariat and the funders. The framework was subsequently endorsed by the inception review team, consisting of externally recruited members. Table 1 illustrates the evolving M&E framework based on the results framework. The cascading logic provides the web for connecting the four logical frameworks. Component Coordinators took responsibility for developing lower level logical frameworks to deliver on the respective component results.

The emerging results framework was not ready for use until the third six-monthly reporting cycle. The outcome was dramatic in guiding the accountability process for the complex ARDSF initiative:

- For the first time ARDSF was able to report against the overall development objectives based on the reports from the respective components. In previous reports the focus was on disaggregate activities at the bottom of the hierarchy of objectives
- The link between organisational capacity building and service delivery became clearer as component level reporting showed synergy towards higher-level outcomes
- However, the initial reporting revealed the need to further sharpen the indicators and called for greater commitment to use recommended reporting formats and time schedules
- It revealed the outstanding challenge of effectively mainstreaming gender and HIV/AIDS despite the well articulated results framework
- The need to account for higher-level development objectives emphasised the need to complete the transformation process of the NARS organisations — developing respective results frameworks and associated organisation and management systems to deliver and account for results

DEVELOPMENT OF CONTRACTOR PERFORMANCE ASSESSMENT FRAMEWORK

Having agreed on the overall results framework that would guide the delivery of ARDSF results, it became necessary to formulate a framework that would allow consistent assessment of the performance of the Managing Contractor to ensure effective and efficient support to the delivery process. Key among the issues discussed to reach agreement on the assessment framework was its premise — which highlighted the different concerns of the Managing Contractor and the donor. AusAID was interested in clarifying the objectives that would be achieved, and the contractor was keen to agree on quarterly performance targets. Focus on objectives represented longer-term outcomes and impact, while focus on quarterly performance targets emphasised short-term activities. It was clarified that quarterly performance targets were already set in facility annual plans; and that these represented milestones along the impact pathway that defined longer-term expected outcomes and impact. The Managing Contractor needed to commit to the latter as the

**TABLE 10.1. INTEGRATED MONITORING AND EVALUATION IN
DECISION-MAKING PROCESSES AT DIFFERENT LEVELS OF OPERATION**

Planning Level				M&E and Impact Assessment Tools		Responsibility For achieving different objectives (i.e., purpose)
System-wide (sector or sub- sector) Planning	Strategic Planning (organisational or agency)	Program Planning	Project Planning	Activity Planning	OVI (Observable Verifiable Indicator)	
System Goal ↑					Indicators for contribution of lower level systems to higher system objectives	Central Government Agency e.g., Ministry of Planning
System Purpose ↑	Organisational Goal ↑				Indicators for contribution of organisations to system objectives	Ministry of Agriculture and/or sub-sector bodies
System Outputs ↑	Organisational Purpose ↑	Program Goal ↑			Indicators for contribution of programs to organisational objectives	CEOs of Research & Extension Organisations
Agencies	Organisational Outputs ↑	Program Purpose ↑	Project Goal ↑		Indicators for contribution of projects to program objectives	Program Leader
	Programs ↑	Program Outputs ↑	Project Purpose ↑	Activity Goal ↑	Indicators for contributions to project activities to project objectives	Project Leader
		Projects ↑	Project Outputs ↑	Activity Purpose ↑	Indicators for contribution of individual(s) to activity objectives	Activity Leader, Scientist
			Activities ↑	Activity Outputs ↑	Indicators for efficient resource utilisation (human, financial, material)	Individuals (Scientist, Extension or Technical Officers)
				Individuals (& other resources)		

Source: França and Sibanda (2010)

basis for performance assessment. While appreciating the need to focus on details, AusAID held the view that since ARDSF was a results-based facility, it was necessary to factor in how the specific activities would add up to higher-level objectives that take much more time and effort to achieve. It was clarified that the emerging ARDSF M&E system was designed to have activity leaders report every month to the thematic leaders (ARDSF advisers); thematic leaders report quarterly to the Component Coordinators. The latter would then report six-monthly and annually to the facility director. This framework was intended to systematically aggregate achievements linking activities to outputs; outputs to outcomes; and outcomes to impact. Therefore, it was crucial that the contractor committed to support the emerging results framework by signing on to the same results framework. Thus the key issue was about re-aligning different frameworks.

ARDSF DESIGN AND IMPACT EVALUATION WORKSHOP

As part of its M&E system ARDSF commissioned an impact evaluation workshop. This was designed to take place after the second half of the facility. It was intended to assess the extent to which the facility had accomplished the following objectives:

- Facilitated organisational capacity development of selected agricultural research and extension institutes to stimulate agricultural development
- Developed the AIGS into an effective funding mechanism to catalyse agricultural innovations that would benefit smallholder agricultural producers in PNG
- The operational systems of the AIGS evolve into a viable national innovations grants scheme
- The three components of ARDSF — Components 1 and 2 addressing capacity to deliver improved services; and Component 3 facilitating service delivery — synergistically function to achieve expected outcomes and impact of ARDSF
- Learned lessons from the design and implementation process of ARDSF

The workshop involved diverse actors — the secretary of the Department of Agriculture and Livestock; chief executives and board chairs of the participating research and extension organisations; chairpersons of key

governance organs of ARDSF; and participants from the rural industries council and agricultural universities. Highlights of the respective components were presented by the Secretariat in plenary sessions, followed by group discussions. Group presentations were subsequently made and debated in the plenary. Key findings of the evaluation indicated that participating research and extension organisations had accomplished the following:

- They were in advanced stages of transforming their respective agricultural research agenda, going beyond the traditional focus on technologies, to include necessary institutional arrangements and policy innovations to drive broad-based agricultural development in PNG
- They had built necessary partnerships to address complex issues impinging on the smallholder agricultural producers along various value chains
- They were in the process of realigning their organisational and management systems to deliver on the emerging research for development agenda
- They were successfully obtaining non-traditional funds to address emerging areas of agricultural research for development agenda
- They were entrenching a learning culture to facilitate continuous improvements in the quality of service they provided to their clients and stakeholders
- They were using AIGS to deliver innovations that benefit even the disadvantaged agricultural producers in remote parts of PNG

These accomplishments were associated with the following elements of the ARDSF design:

- Focus on outcomes and impact. This generated need for fundamental organisational changes in the NARS
- Concept of the Facility as a pool of funds to be used for capacity development as needs continued to emerge over time. This allowed necessary flexibility for demand-driven innovations.
- Separating the needs assessment process (NARS with the help of AusAID appointed specialists) from the response mechanism (Managing Contractor). This catalysed innovation on both sides — as the NARS' needs evolved, so did the Secretariat.
- Provision of three different but interrelated Components — the first two for capacity building to enhance service delivery; and the third

(AIGS) to utilise that capacity to generate expected outcomes and impact. This provision allowed specific organisations to move at their pace; and encouraged utilisation of new capacity for enhanced service delivery.

INDEPENDENT PROGRESS REVIEW

As ARDSF entered into its second half, AusAID Canberra decided to conduct an independent progress review of the facility (Fargher and Kiap, 2010). It was also decided that this review would be combined with a broader thematic review of AusAID support to research in PNG (health, education and agriculture). In this regard, it was cautioned that the review would need to be aware that each research program was supported to deliver different dimensions of research e.g., organisational development, piloting competing funding mechanisms, developing innovative research approaches and methods, addressing topical areas of research and staff development, etc. Under the circumstances, while it may have been desirable to conduct a holistic review of the three components at the same time for more comprehensive lesson learning, the methodology used needed to be broad and versatile enough to accommodate the diverse objectives driving the respective initiatives.

Following negotiations between AusAID Post (PNG) and Canberra⁷, the following understanding was reached:

- ARDSF had orchestrated an important paradigm shift in the participating national agricultural research organisations, leading to greater emphasis on impact of research on smallholder agricultural producers. This had involved redefinition of the research portfolio and the associated organisations and management, with greater emphasis on partnerships, and piloting a funding mechanism to catalyse innovation in the agricultural sector.
- The planned internally commissioned mid-term review of ARDSF design and impact would be facilitated by the Managing Contractor in consultation with AusAID Post; and key stakeholders of the ARDSF (e.g. the Management Committee and Steering Committee). In this way it would be part of best management practice, especially in the context of managing a fluid facility.

⁷ AusAID Post (PNG) - A. Mbabu; and Canberra - Janet Donnelly and Russell Harwood.

- The Independent Evaluation of ARDSF (Canberra managed) would, therefore, need to build on this internally commissioned initiative by focusing on the higher level analysis of the utility of the facility as an aid delivery modality.

As it turned out, these suggestions were not picked up in the Canberra-led review. Consequently, the review covered all levels of operation: activity to output; output to outcome; outcome to impact. Given the complexity of the ARDSF initiative — organisational capacity building, innovations grants scheme, mainstreaming of gender and HIV/AIDS, the limited timeframe for the review — the report turned out to be controversial. Although the report (Fargher and Kiap, 2010) appeared to appreciate the transformative role of ARDSF in the PNG NARS, it failed to appreciate the transformative process that had taken place in the NARS organisations.

HOW WELL DID THE ARDSF M&E SYSTEM PERFORM?

In designing the M&E system of ARDSF, as discussed above, considerable thought and discussion was given to what should constitute the system. In so doing, the following basic M&E elements were refined, developed and incorporated as integral parts of the system. These are:

- The objectives of ARDSF at various levels
- Detailed results frameworks reflecting the objectives at the various levels of ARDSF (the results frameworks contained the performance indicators against an objective, their means of verification and the assumptions associated with the objective)
- A detailed M&E Operational Plan outlining the appropriate tools and methods required for collating the required data, while also highlighting responsibilities among project staff in terms of who should do what and when
- Reporting arrangements described what types of reports were required at different levels and how often these reports should be written, including what should be the content of a particular report.
- M&E instruments for data collection and aggregation included monthly activity matrices.
- In designing the M&E system of ARDSF, risk management was considered an integral part of performance management. Hence, guidance was offered in integrating management of risks.

- Evaluation arrangements, both internal and external, that were relevant for ARDSF, were identified and described, including establishing time schedules for these various assessments.

Having included these key components in the design, the M&E system was perceived as being robust for measuring ongoing performance of ARDSF towards its set objectives and results. Table 10.2 illustrates the main outcomes expected and the indicators associated with these outcomes, which formed the basis of the M&E system.

The Activity Completion Report (ARDSF, 2012), prepared by the facility manager on behalf of the Managing Contractor, provides a succinct assessment of the value of ARDSF's M&E system.

Although the design of the system was sound, its implementation was weak and inconsistent in providing ongoing assessments of ARDSF's performance.

The report (*ibid.*) indicates a number of factors that contributed to this:

a) Delays in developing and implementing an M&E system for ARDSF

The M&E system should be developed and implemented in the first six months after inception of a project. However, the actual M&E system of ARDSF was not finalised until two years into the life of the facility and was not implemented until the beginning of the third year of the facility. The main reason for the delay was that time was required for the NARS organisations to reach a level of understanding of the theory of change of the capacity building process that ARDSF's support was assisting with.

b) Challenges in implementing the M&E system of ARDSF

The implementation process involved setting up the various instruments for collecting data, such as monthly activity matrices, testing these instruments for accuracy, relevance and user friendliness, updating these instruments where necessary and training the project implementation team on the use of these various instruments/processes. The testing and trialing of the M&E system took approximately the first 4-5 months. There were numerous challenges in implementing the system, including:

- Lack of consistency (and continuity) in the use of the various M&E instruments/ processes for compiling and analysing data, and using the same for reporting on progress towards achievement of key results
- High staff turnovers, both at the top management level and at the advisory level. For instance, at the time of developing the system, the facility was into its fifth manager — in other words, ARDSF had four previous facility managers. Staff turnover was also noticeable at the component coordinator and the advisory levels
- Insufficient resources allocated to deliver on key results scoped at the various levels of ARDSF. The design clearly articulated the objectives sought of ARDSF at different levels. However, the resources made available did not match the scope of tasks identified.

On the evidence available it is not possible to come to any definitive conclusions about whether the M&E system was able to fulfil its anticipated role of managing the iterative learning process that is at the heart of AR4D. The development of a results framework was clearly critical in driving discussions about a new theory of change for the organisations involved in ARDSF, and in the development of their strategic plans. The development of M&E arrangements to drive the notion of learning organisations did not take place until very late into ARDSF and it is not clear whether this will prove sufficient to sustain the learning-driven capacity development process anticipated.

What does, however, emerge from the experience of ARDSF is that the development and implementation of an effective M&E system faces a set of challenges that are common across development interventions more generally. These include the different demands of stakeholders on the purpose of the system, as well as the types of information on progress that is needed and the use that different stakeholders wish to use this information for (accountability vs. learning). The challenges also include the resources made available for M&E activities and the capacities to perform these activities. Finally, the discussion highlights the point that the challenges of M&E are not so much in the design of these systems, but in the ability of these systems to be implemented effectively. One is left with the impression that a simpler, more user-friendly system might have ultimately been a more effective way of managing implementation performance.

LESSONS

The glue that holds together the agricultural research for development system is an effective monitoring and evaluation system. Developing such a system within ARDSF and among the NARS organisations was a complex and iterative process. Lessons include:

- The need to develop a results framework that outlines complex impact pathways and the value of a cascading logic
- The value of consultations with a range of stakeholders in developing the results framework
- The need to align results frameworks at the level of the facility and organisations
- The challenge of accommodating future intervention elements that will only emerge later
- Demarcating responsibilities for monitoring different elements
- The need to align goal and purpose with national level development plans and impact ambitions
- The role of the results framework in clarifying design and developing a shared understanding in the ARDSF team of the conceptual underpinnings and theory of change of the program

Ultimately the emerging framework tied the different but inter-related pieces together in a cascading fashion:

Through ARDSF: Facilitation process of organisational development of selected NARS organisations, resulting in organisational development of the NARS.

Through the NARS: Service delivery process to diverse clients and stakeholders, leading to adoption of technologies and associated innovation processes among diverse agricultural producers.

Through AIGS: Innovation processes leading to livelihood improvements of the smallholder agricultural producers at scale.

TABLE 10.2. EXPECTED OUTCOMES, ACHIEVEMENTS AND EVIDENCE FROM IMPLEMENTATION OF ARDSF ACTIVITIES

EXPECTED OUTCOMES	OUTCOME ACHIEVED	EVIDENCE (From M&E or performance assessment framework)
ARDSF -Level Outcomes		
<p>1. Agricultural R&D organisations in Papua New Guinea operate as an integrated and sustainable NARS that serves the needs of smallholder farmers, both women and men</p>	<p>The NARS organisations are collaborating in developing sector plans and visions and sharing research resources</p> <p>The NARS organisations have established partnerships in projects to jointly meet the needs of smallholder farmers</p> <p>The NARS have established a policy forum to jointly advocate for policy change that helps serve smallholder farmers</p>	<p>MC Meeting Minutes</p> <p>Joint Letter of Response from the NARS organisations to ARDSF</p> <p>Mid-Term Review Findings and Recommendations</p> <p>Grant Agreements signed by NARS organisations under AIGS</p> <p>NARI sharing its human resources in Geographical Information Systems (GIS)</p>
<p>2. Smallholder farmers both women and men, adopt agricultural innovations disseminated by AIGS projects</p>	<p>Thirty one (31) AIGS funded projects have helped smallholder farmers, both women and men, to adopt agricultural innovations</p>	<p>Field Reports, special reports and the newspapers citing 'AIGS Success Stories'</p>
<p>3. NARS organisations, NARI and their partners address gender and HIV/AIDS in agricultural research and development</p>	<p>NARS organisations have integrated gender and HIV/AIDS in their planning processes</p> <p>NARS partners to integrate gender and HIV/AIDS in their planning processes</p> <p>Overall awareness on the impact of HIV/AIDS and gender has been increased among NARS organisations and their partners</p>	<p>Strategic, Program and Project Plans of NARS organisations — in particular, CIC, CCI, FPDA and NARI</p> <p>AIGS Project Proposals</p> <p>ARDSF Internal Strategy on Mainstreaming Gender and HIV/AIDS</p>

4. The AIGS evolves as a competitive national agricultural innovation grants scheme	<p>Relevant systems and processes for managing a competitive grant scheme have been developed, tested and refined.</p> <p>Proposal pending with GoPNG to adopt AIGS as a national agricultural innovation grant scheme</p>	<p>AIGS manuals and guidelines</p> <p>Report on the 'NARS Policy Forum' held in Madang Resort in October 2011</p> <p>Draft NEC Submission</p>
Component 2-Level Outcomes		
Outcome 1. Enhanced corporate governance and management of NARS organisations	<p>Five NARS organisations have involved their stakeholders, including their boards, at the different stages of their strategic, program and project planning</p> <p>The CEOs of the NARS organisations have demonstrated great confidence and excellent leadership skills/qualities in leading and managing their organisations</p> <p>Middle level managers have also demonstrated their capacity to lead and manage for results, particularly their ability to translate their programs/projects to meet clients' needs</p> <p>The NARS organisations have started the internal restructuring process, after having successfully scoped their key results through the planning process. Several of the NARS organisations have started the process of re-allocating resources to deliver on their expected results</p>	<p>Strategic plans of NARS</p> <p>Workshop reports of learning modules</p> <p>Findings of mid-term evaluation</p>

TABLE 10.2. EXPECTED OUTCOMES, ACHIEVEMENTS AND EVIDENCE FROM IMPLEMENTATION OF ARDSF ACTIVITIES

EXPECTED OUTCOMES	OUTCOME ACHIEVED	EVIDENCE (From M&E or performance assessment framework)
Component 2-Level Outcomes		
Outcome 1 (Continued). Enhanced corporate governance and management of NARS organisations	<p>Planning, monitoring and evaluation is integrated. Out of the five NARS, CIC, CCI and FPDA have completed about 90% of their planning and are near completion of their M&E framework. OPIC and OPRA have completed strategic planning and scoping of programs. Building an M&E system for all the NARS commenced in 2011.</p> <p>All the six NARS organisations have undertaken the initial training and commenced work on the Strategic Development and Management of Human Talents in strategies, systems, structures and culture of organisations</p>	
Outcome 2. Improved responsiveness of the NARS organisations to client needs	<p>NARI's technical input into the planning process — in terms of the GIS tool — helped the NARS organisations scope and incorporate socioeconomic priorities within specific programs/projects. The sub-sector studies have also contributed to this result. The development of aid responsiveness in project planning is the key outcome</p>	Strategic, program and project plans of the NARS organisations
Outcome 3. More coordinated and unified support from the NARS organisations to the PNG agricultural sector at strategic and operational levels	All the NARS organisations have fully embraced the concept of partnerships and networks and the need to establish and maintain partnerships in order to deliver on their expected results	Six NARS organisations signed an agreement to work towards common goals under ARDSF

	<p>The NARS organisations have formed a number of partnerships, both within the NARS and with other stakeholders, particularly through AIGS projects</p> <p>The NARS organisations, through various representatives, have participated in policy-making processes, including CIMC and Vision 2050 consultations</p>	<p>Workshop report on aligning Department of Agriculture and Livestock with PNG 2050 Vision</p> <p>Meeting minutes from the CIMC agriculture committee</p> <p>Meeting minutes from the ARDSF NARS technical committee</p>
Outcome 4. Women and men receive equal opportunities and respect in the governance and management arrangements of NARS organisations	<p>Women are starting to take key positions of leadership in the NARS organisations</p> <p>Women from the NARS organisations participated in the capacity building efforts offered by ARDSF</p>	<p>Staff profiles of PNG research organisations, seen on websites</p> <p>Workshop reports of learning modules</p>
Outcome 5. NARS organisations address HIV/AIDS in their governance and management arrangements	<p>The NARS organisations are fully sensitised to the need to mainstream HIV/AIDS. However, there has been slow progress in enabling the NARS organisational systems & processes for mainstreaming HIV/AIDS</p> <p>Most of the NARS organisations have indicated that they are networking and partnering with other established groups, such as instance national/provincial AIDS Councils, etc., to address the impacts of HIV/AIDS</p>	<p>Strategic plans of NARS organisations</p>

Source: ARDSF (2012)

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Facilitating Research-Policy Linkages

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INTRODUCTION

This chapter discusses the way in which ARDSF, in its efforts to facilitate capacity building, recognised the need to create linkages between agricultural research and policy-makers and the policy-making process — a key element of the AR4D orientation. We describe the way that the Papua New Guinea NARS organisations, once armed with credible impact-oriented strategic plans, were welcomed into national development planning processes. Their engagement with policy-makers helped drive the emergence

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of a new policy narrative that positions smallholder agriculture centre stage in national development plans.

The establishment of a NARS policy forum formalised this process of policy engagement. At the time of writing, subsequent events were set to embed the policy forum in a new type of sector support policy instrument — the National Agricultural Innovation Facility (NAIF). The role of ARDSF in this was catalytic, but it was helped enormously by the political capital of key sector champions in a new people-focused national development plan — the PNG Vision 2050.

RECAP: RESEARCH-POLICY LINKAGES IN AR4D

Innovation systems perspectives and an AR4D orientation explicitly recognise the critical role of policy and institutional arrangements, as these form the enabling environment for innovation at the sectoral and national level. This environment provides incentives and support to innovation that addresses different social and economic goals in the sector. It determines the extent of linkages between sector interventions; for example, between agriculture and health or education. It also sets a framework for how different organisations work (both independently and collectively), how plans and priorities are formulated and how the execution of these plans is monitored and evaluated.

This enabling environment manifests itself in various ways: through national and sectoral development plans; through regulatory policy; through the nature of the policymaking and legislative processes; through the mandates and rules that govern the operation of public research, education and financial organisations; and through taxes and other incentives that motivate and shape private enterprise.

An AR4D orientation takes a special interest in policy and the enabling environment. It recognises that the ability of agricultural research to deliver people-level impact is dependent on collaboration with a range of partners outside of research — not only development organisations and the private sector, but also policymakers.

It, however, also sees this collaboration in terms of the alignment of different organisational objectives with national efforts to achieve improved rural prosperity. In other words, AR4D goes beyond simple partnership ideas of

pooling resources, expertise and ideas to drive innovation. Instead, it calls for agricultural research to be part of integrated sectoral and national plans, where the goals of improved livelihoods of farmers are achieved through the combined efforts of improved delivery of agricultural research services to farmers, improved rural infrastructure, improved health and education services, improved rural financing and improved entrepreneurial activity.

This means that AR4D can be a very ambitious approach. It is one that sees that the effectiveness of agricultural research as a policy instrument for development is dependent on the coherence and impact logic of wider sectoral and national policies — and the interventions and actions that these support.

More specifically it is dependent on the coherence and impact logic of these policies being explicitly directed towards improving the livelihoods of smallholder farmers and poor rural communities. In other words, it calls for a smallholder-centric development paradigm and pathway, not just smallholder-focused research and extension.

The extreme counter-position to this would argue the futility of attempting to improve the livelihoods of smallholders through research and productivity improvement in a development paradigm premised only on employment generation in the extractive industries and the plantation sub-sector.

This would be a perfectly legitimate development pathway, but one with huge social costs in a smallholder agrarian society such as PNG.

So what does this perspective mean for capacity building in agricultural research and extension organisations? Firstly, the capacity of these organisations is only as good as the enabling environment of policies and institutional arrangements in which they sit.

Secondly, a critical element of the capacity of research and extension organisations to deliver services to smallholders and contribute to livelihood impacts is their capacity to influence their enabling environment — particularly national and sectoral-level plans.

Thirdly, this capacity to influence plans and the enabling environment concerns not only the competencies to undertake policy and institutional research, but also the effectiveness of channels of communication and engagement with the policy process.

RESEARCH-POLICY LINKS IN ARDSF

Building capacity for credible planning

ARDSF's design had always anticipated that developing linkages between research and policy was an important dimension of developing the capacity of the NARS organisations to improve service delivery to smallholder farmers. The way this unfolded was, however, as much to do with the dynamics in the national policy process and the opportunities this provided as it was to do with the support ARDSF provided to the NARS organisations.

The starting point for building links with policy was during the early phase of ARDSF's support to the NARS organisations. During this period (as discussed in detail in chapters 5, 6 and 7), the organisations carried out capacity needs assessment and strategic planning exercises. A central element of the capacity building support at this time was to help the NARS organisations confront the gap that existed between their stated goals of improving livelihoods and food security of smallholders and their project activities that were addressing technical research questions. This process helped the NARS organisations realise that their current portfolio of activities had little chance of realistically contributing to their goals. The stagnation of productivity in the country was just one symptom of this (see chapter 3).

The subsequent development of new strategic plans outlined ways of filling this gap and changing the organisations' structures. The key institutional innovation was the development of programs and sub-programs to cluster and add value to individual projects and deliver higher-order outcomes that would contribute to the organisations' purposes (couched in terms of improved productivity and sustainability of the smallholder agricultural sector).

This, in turn, would allow the NARS organisations to contribute to national-level aims of improving livelihoods of rural households.

These institutional innovations presented a realistic plan of how different pieces of research projects (often linked to developmental activities) could be coupled together in a cumulative hierarchy to achieve higher-order ambitions of productivity and welfare impacts at a national scale. To make the same point differently, the assumptions in the impact pathway were made operationally explicit in project, program and organisational structures and strategy. This gave the NARS a potentially achievable plan for impact and, as will become apparent shortly, a seat at the high table of policy debates in PNG.

Windows of opportunity in the national development policy narrative

Around this time (2007-8) it was not only the NARS organisations that were confronting the planning rhetoric of addressing welfare goals. At the national level there was a growing sense that PNG's development pathway was not working. The country is potentially very rich with extensive mineral resources and huge sovereign wealth windfalls from the exploitation of these. Yet the human development indicators for the country are some of the lowest in the world and have been worsening. Mineral wealth seems to have few positive impacts on the rural population, 80% of whom are smallholder farmers, and the issue of benefit sharing is becoming politically contentious. There is also a sense that this could have huge social costs in the future, with civil disorder and political instability a real possibility.

It was at this point that a prominent politician (subsequently the Minister of Agriculture and Livestock) began a process of revisiting existing national plans. This subsequently became the PNG Vision 2050 exercise. The challenge for this exercise was developing a plan that laid out a realistic and achievable impact pathway for a whole array of different public policy instruments, such as research, education, health, infrastructure and services. It was, of course, here that senior managers from the NARS organisations had much to offer as a result of the planning process that they had been through in their own organisations.

The actual Vision 2050 process involved extensive consultations in all regions of the country. The NARS organisations' contribution to this process was in helping to develop the impact logic to achieve the goals envisioned for PNG. The Vision 2050 document was published in 2009 (GoPNG, 2009) and was greeted with great excitement and the anticipation that this could be the start of a new development pathway for the country. This lent urgency to the political backers of the plan to put the vision into action. But how was this to be operationalised?

The Vision 2050 document sets out seven pillars that, if achieved, will allow PNG to reach its goal of a "smart, wise and fair, healthy and happy society". Supporting these pillars are policy instruments such as agricultural research. Of course, the whole impact logic of the strategy hinges on the robustness of plans at all levels. Once again, because six of the NARS organisations had developed realistic impact-oriented strategic plans with the support of ARDSF, they became the focus of political and policy attention as they had a model of how to operationalise the Vision 2050 document at the action level.

One way in which this attention manifested itself was that the Department of Agriculture and Livestock (DAL) approached the NARS organisations and ARDSF for help in revisiting the National Agricultural Development Plan (NADP) (DAL, 2007) and realigning it with the goals of Vision 2050. There was tacit acknowledgement that the NADP was not working as an effective mechanism of supporting smallholder agriculture or indeed the sector as a whole. The NARS, ARDSF and DAL held a three-day workshop in 2010 to help refocus the NADP.

By this point there was a tangible shift emerging in the policy narrative in the country. Agriculture was no longer ignored or viewed as a traditional sector. Increasingly, discussions by politicians and senior bureaucrats placed agriculture in the role of the backbone of PNG's economy, with smallholders being the main focus of attention. This gave ARDSF — given its capacity building efforts in the NARS organisations — a critical window of opportunity to pursue policy dimensions of the AR4D orientation it had adopted. As discussed earlier the success of AR4D, and indeed of agricultural research as an effective tool in development, hinged on the capacity of the NARS organisations to influence policy and institutional arrangements in the enabling environment.

The establishment of the NARS policy forum

The NARS organisations had already decided to establish a policy forum as part of the capacity building support from ARDSF. The logic for this was that it would create the space for the NARS to engage with policy-makers and allow them an opportunity to shape policy-making in the direction of the AR4D vision of a smallholder-centric development paradigm. It was also anticipated that the forum would provide an opportunity to tackle other institutional arrangements that would support innovation in the sector. With PNG's new-found policy interest in agriculture as a general development strategy, the time was ripe for this idea to be put into practice.

To launch and establish a policy forum, ARDSF and the six NARS organisations it was working with convened a three-day meeting in October 2011. The aim of this meeting was to discuss the idea of a formalised policy forum and to explore how it could be put into practice. Participants at the meeting included senior representatives from all the agricultural research and extension organisations of PNG, representatives from universities and the education sector, representatives from major agro-industrial enterprises, and representatives from key civil society organisations involved in rural

BOX 11.1. AIMS OF NEC SUBMISSION ON NARS POLICY FORUM

1. To inform the NEC on the rationale, objectives, stages and outcomes of the inaugural PNG NARS Policy Forum held in Madang from September 28 to 30, 2011.
2. To inform the NEC on the establishment of the PNG NARS Policy Forum, and its role in fostering dialogue and capacity to unleash the full potential of Agriculture for Development as a route to achieving Vision 2050.
3. To inform the NEC on innovative agriculture for development and the agricultural innovation system as a model for building a national innovations system to foster rethinking and realignment by the whole of the government in other sectors to build a smart, wise, happy and healthy PNG society by 2050.
4. To recommend that the government provide an initial contribution to support the establishment and institutionalisation of the PNG NARS Policy Forum and events to foster informed and wider policy dialogue.

Source: (DAL, 2011)

development. More crucially, government policy-makers were also present, including secretary-level bureaucrats from different line departments (including agriculture, commerce and industry) and the chief secretary to the government of PNG — the principal policy-maker in the country. The Minister of Agriculture and Livestock opened the meeting and endorsed the NARS policy forum in his speech. This signaled both the new-found confidence in the PNG NARS in national development, but also the political urgency to take forward the Vision 2050 document with a lead from the agricultural sector.

The meeting proceeded with a series of presentations on the rationale of the forum and on a vision of a new policy era of innovative agriculture. These topics were robustly discussed. However, the meeting got down to its real business on the last day when a senior advisor to the government laid out the steps needed to formalise the policy forum as part of the PNG policy-making process. The NARS steering committee (the conveners of the inaugural policy forum) was advised that it needed to help the Ministry of Agriculture and Livestock prepare a statutory information briefing paper to submit to the PNG government's National Executive Council (NEC). This would allow the NARS policy forum to become a recognised entity within the policy-making process of the country.

The statutory briefing paper was prepared within two weeks of the first forum meeting and submitted by the Ministry of Agriculture to the NEC, as suggested. The aims set out in the NEC submission are illuminating because they go beyond just the establishment of the NARS policy forum to support policy dialogue, but also go on to flag the ideas of AR4D to build a national innovation system that promotes rethinking and realignment of other sectors to achieve the goals outlined in the Vision 2050 document. It also requested seed funding for the forum (The aims of the NEC submission are presented in full in box 11.1).

In the wake of this first forum meeting, ARDSF held discussions with the NARS organisations (technical committee meeting) to discuss what sort of policy research and allied skills would be necessary to support the increasingly prominent role of agricultural research in the policy process. The following topics were suggested and although skills have yet to be built in all these areas in PNG, they illustrate the new range of skills that may be required (full details are presented in the Technical Annex that follows this chapter).

- *Policy analysis.* Research expertise on the effectiveness of existing and new agricultural sector policies from the perspective of a smallholder agriculture-driven development paradigm, with a major focus on the distributional effects of different policy instruments.
- *Diagnostic and policy studies of innovation capacities and processes.* Research expertise on the diagnostic assessments of innovation arrangements (actors, linkages, institutions and policies) on selected developmental themes.
- *Monitoring and impact evaluation of policy instruments.* Expertise in monitoring and evaluation activities to generate information and lessons on the effectiveness of new policy and institutional arrangements and other interventions, such as financing mechanisms.
- *Future scoping studies.* Expertise in generating information about possible different futures and pathways to achieve development goals. This might involve different visioning, foresight and scenario planning exercises.
- *Communication.* Expertise on communication for intermediation. This certainly involves the traditional role of helping to disseminate

research findings effectively and in accessible formats. However, it also includes a more proactive role in mediating change among multiple interest groups and stakeholders.

NEXT STEPS: A PROPOSED NATIONAL AGRICULTURAL INNOVATION FACILITY

One of the other outcomes of the inaugural policy forum was the endorsement of the policy option to establish a national competitive grant scheme as a way of pooling resources and channeling them to both public and private players in the agricultural sector. This, as will be related in a moment, proved critical for the way the NARS policy forum became part of a much wider policy instrument for supporting smallholder-centric agricultural sector development.

The origins of this lie in ARDSF's efforts to pilot a competitive Agricultural Innovation Grant Scheme (AIGS). The rationale behind the scheme was that it would provide a way of funding a new way of working in the NARS organisations — encouraging them to work together and collaborate with developmental organisations to improve their outreach (chapter 9 is devoted to a discussion of this).

AIGS was designed to identify promising areas of innovation — for example, in value addition or in synergies between education and agriculture — and develop coalitions of research and non-research organisations to drive innovation forward in the selected theme. Of equal importance, however, was the fact that ARDSF and the NARS organisations had established the scoping, advisory and monitoring and evaluation mechanisms to ensure that the scheme targeted demand and achieved people-level impacts.

The government of PNG had been considering a national competitive grants scheme for some time. AIGS's track record and its endorsement by the policy forum as a potential national initiative made it a viable model for a national policy instrument to support agricultural development.

At the time of writing this book a proposal is before the PNG government to create a new entity that will link the NARS policy forum and the National Competitive Agricultural Innovation Grant Scheme (NCAIGS). This entity will be the National Agricultural Innovation Facility (NAIF). Its role will

mirror much of the way ARDSF has operated. It will advise on capacity development of agricultural research and extension organisations (in the sense of the way they work and their responsiveness to sector needs and in terms of the scientific skills required to play their role). It will also enable dialogue between agricultural research and sector policy, besides championing smallholder-centric development plans in national policy debates. The proposed entity will also ensure that innovation is supported, encouraging the development of coalitions of different research and development organisations around key areas of innovation.

Clearly, the NAIF is yet to come into being. However, it does illustrate the nature and sorts of policy, bureaucratic, organisational and institutional arrangements that are required at a national level to make AR4D a reality. One might think of this facility as an AR4D interpretation of the old idea of an agricultural research council. It also reveals the enormity of the capacity building task for AR4D. It is no longer just about the skills and ways of working in research and extension organisations, nor is it just about helping these organisations be more responsive to the technological needs of smallholder clients. It is all this, but yet much more. It involves creating a new type of policy instrument at the national level that can fund interventions and shape policy support for an entirely new sort of smallholder-centric development pathway.

ATTRIBUTING SUCCESS

As a postscript it is important to stress that the way these events unfolded in PNG was specific to the prevailing political and institutional environment. This is not to underplay ARDSF's critical role in assisting the NARS organisations build their capacity for policy engagement as part of the AR4D approach. The ability of the PNG NARS to emerge as a credible set of organisations — with a workable plan for achieving developmental impact — was an essential ingredient for the series of events described in this chapter. However, the convergences with new political directions also proved critical. The role of political champions cannot be overstated, nor can political urgency for demonstrating operational traction of the new national development plan (the Vision 2050) be ignored. The submissions to the NEC explicitly highlighted the political dangers of not moving ahead quickly and decisively with policies aimed at addressing smallholder agriculture and demonstrating benefit sharing from the government's new-found sovereign wealth. This political urgency moved things along considerably.

The rapid unfolding of events following the NARS policy forum was certainly driven by this urgency. However, it was also speeded up by the facilitation of discussions by the ARDSF network of stakeholders in the NARS organisations. A little of this path was smoothed by strong personal connections between key stakeholders and prominent political figures championing the process of orienting policy towards development. This is not to detract from the results achieved, nor does it suggest that any ulterior motives were at play. Rather, it is to underline that new strategic planning capacities in the NARS started to take shape at a time when a different pathway to development was being discussed in policy circles. The NARS' new capacity enabled them to fully participate in this policy process. The challenge now for PNG is to keep that pathway alive and innovative.

LESSONS FOR BUILDING CAPACITIES TO LINK RESEARCH TO POLICY

A number of general lessons, which have wider relevance, emerge from these experiences.

- *New skills and new structures:* Quite clearly agricultural research organisations need to learn new policy research and communication skills if they are to play an effective role in shaping sector policies. However, of equal importance is the creation of specific organisational structures that allow a productive interface to be developed between researchers and policy-makers. In this case that structure was a NARS policy forum. This, in turn, is set to become part of a larger administrative structure with formal links to the policy-making process. Without this sort of architecture, linking research to policy is difficult to operationalise.
- *The value of building credible capacity in the NARS organisations for impact-oriented planning:* To gain a seat at the high table of national policy-making it was first necessary to demonstrate that the NARS organisations had credible capacity in impact-oriented planning. Capacity building was, therefore, an important step in enabling the NARS organisations to become active participants in the policy-making process. Once they became linked to policy-making it also revealed a range of research and communication competencies that are required to service this new role in the policy process.

- *The providence of serendipity*: The way events unfolded in PNG meant that a critical policy window opened at precisely the time that the NARS organisations needed to engage with the policy domain in new ways. This was serendipitous rather than planned, but the NARS organisations were nevertheless able to take advantage of this opportunity.
- *The role of key political champions*: The NARS organisations were able to identify and work with political champions of the smallholder agricultural development paradigm and this was central to the AR4D orientation that they adopted. This underlines the importance of forming alliances and coalitions around major policy shifts needed for AR4D, as well as the pivotal role sector champions can play.

TECHNICAL ANNEX

POTENTIAL AREAS OF CAPACITY BUILDING IN POLICY RESEARCH AND ALLIED AREAS TO SUPPORT LINKAGES BETWEEN AGRICULTURAL RESEARCH AND POLICY IN PNG

Policy analysis. This area of research would explore the effectiveness of existing and new agricultural sector policies from the perspective of a smallholder agriculture-driven development paradigm perspective. A major focus would be an analysis of the distributional and targeting effects of different policy instruments. This requires agricultural and development economics research skills with specific expertise in policy analysis. Other allied competencies in this area would include: sociology of development, gender studies, social anthropology and geographical information systems. Currently the PNG NARS have some competencies in production and marketing economics, but limited expertise in policy analysis.

Diagnostic and policy studies of innovation capacities and processes. This area of research would involve diagnostic assessments of innovation arrangements (actors, linkages, institutions and policies) on selected developmental themes. There are two dimensions to this. The first type of research would explore the wider enabling innovation policy environment. Here the focus would be on issues such as policy coherence between agriculture and other sector policies, regulatory frameworks and institutional arrangements in sector support organisations such as extension, education and finance. The second type of research in the area would have a more operational flavour, exploring partnerships and institutional bottlenecks in specific areas of research and development. Innovation policy analysis needed for the first type of research is a specialised area of economics research, usually performed by science and technology policy analysts. This is an uncommon research skill in agricultural research organisations and the PNG NARS, not surprisingly, have no expertise in this area. Preferably, diagnostic assessments with a more operational flavour should be performed by agricultural scientists equipped with appropriate research techniques — although social scientists and economists often perform this type of research. The NARS, and specifically NARI, have a limited number of scientists who have been exposed to this type of innovation study through training from the Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA). These skills are not routinely used so there is little practical diagnostic experience.

Monitoring and impact evaluation. This is not strictly an area of research, but concerns monitoring and evaluation activities to generate information and lessons on the effectiveness of new policy and institutional arrangements and other interventions such as financing mechanisms. This could be focused on investigating three levels of the enabling environment and this would include: Exploring the consequences of new policy and institutional arrangements in terms of distributional consequences; exploring linkage and network development consequences; and exploring responsiveness consequences and the institutional changes that support this. While classic impact studies have been the domain of economists and monitoring has been performed by specialists (often also economists), current thinking on monitoring and evaluation points to the importance of other skill sets, particularly analysis of institutional outcomes. Also, monitoring is now viewed as an embedded activity that all intervention personnel need to take responsibility for and is chiefly concerned with reflecting on the effectiveness of process and making mid-course corrections (Hambly, Hall and Dorai, 2012).

Recent thinking on impact evaluation links together quantification of impacts with interrogation of theories of change and this often involves exploring institutional changes and tracing causal processes. Monitoring and evaluation competencies are undoubtedly present in the NARS organisations in Papua New Guinea. The priority here would be to update these competencies bearing in mind the demands of innovation systems-inspired interventions and learning-based processes of change and upgrading. Much ground has already been covered, in the sense that NARS scientists have been involved in developing results frameworks and M&E systems for their new strategic plans.

Future scoping studies. Again, this is not strictly an area of research, but it nevertheless involves generating information about different possible futures and pathways to achieve development goals. This might involve different visioning, foresight and scenario planning exercises. Beyond a planning function, these exercises have an important role in bringing together different stakeholders and this helps build linkages between them. Some NARS scientists have experience of this type of activity through the development of strategic plans and through the involvement of some in the PNG Vision 2050 exercise. It is, however, an area where international practice has advanced significantly in recent years. NARS scientists and their policy-making partners would benefit from the new techniques that are emerging from international practice.

Communication. This is another area that is now viewed as a critical accompaniment to policy research. It is also an activity whose scope has been redefined in international practice in the light of the contemporary understanding of the learning, innovation and change processes. Communication is now viewed as a process of intermediation. This certainly involves the traditional role of helping disseminate research findings effectively and in accessible formats. However, it also includes a more proactive role in mediating change among multiple interest groups and stakeholders. This involves facilitation of negotiations about change, creating platforms for discussion and sharing of research findings, and helping articulate demand for research from policy-makers, etc. The NARS organisations currently have competencies in traditional aspects of communication. They have also engaged in the wider set of activities that communication is now understood to involve as part of their strategy development exercises and as a pragmatic tactic in operationalising a more collaborative mode of agricultural research implied by AR4D. The NARS would benefit from continued exposure to new techniques that are emerging from international practice.

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SECTION IV: Outcomes and Lessons

An Unfinished Symphony? Achievements and Sustainability of ARDSF

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INTRODUCTION

The chapters in section 3 of this book have described the capacity building process of ARDSF in detail. This chapter presents a review of ARDSF's main achievements. It is based largely on the findings of three reports: the independent completion report of ARDSF (Hall and Gilbert, 2012), a review of Australia's support for the PNG agricultural sector (Gilbert and Hall 2012) and ARDSF's own activity completion report (ARDSF, 2012b). The purpose of this chapter is to collate evidence of ARDSF's achievements and reflect on the sustainability of the capacities developed. This sets the scene for the subsequent and final chapter in the book, which draws together the main lessons from the ARDSF experience and its use of AR4D as a guiding framework.

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WHAT HAS ARDSF ACHIEVED?

At the start of ARDSF the NARS in PNG were a fragmented set of research organisations disconnected from each other and from national and sector development plans, and from wider development interventions and processes. This earlier situation was often referred to as dysfunctional — a view that has still not been entirely dispelled. A Government of Papua New Guinea commissioned Agriculture Sector Functional Expenditure Review (2005) provides a powerful description of the capacity building challenges faced by the sector at the beginning of ARDSF:

“There is clear evidence of duplication and inefficiency (among the NARS). The sector is typified by fragmented management, poor relationships and a lack of coordination; Relationships between agricultural agencies are not based on a sector plan or shared vision. Resource and management inputs between these agencies are un-coordinated, expensive and service delivery to farmers is adversely affected; there is neither sector voice nor shared vision to influence the Government planning and budget processes leading to inadequate and inconsistent allocation of funds to core priority programs and activities.”⁵

ARDSF’s own view of its achievements upon its completion presents a picture of a transformed agricultural sector in stark contrast to this earlier situation. The Activity Completion Report prepared by ARDSF (2012b) highlights two broad areas of achievement for the program:

- a) ARDSF helped retool the NARS organisations for impact through a sustained capacity building process, which has resulted in: new strategic plans; results-based management and new program structures; new partnerships and communication skills and strategies; and the strategic development of human talents. The PNG NARS organisations emerge from the capacity building support of ARDSF as a more coherent set of organisations, working collectively with partners to address client-oriented priorities set out in strategic plans that align with national development goals and which mainstream gender and HIV/ concerns. This coherence is best evidenced by the NARS Policy Forum, which

⁵ Government of Papua New Guinea (2005). Functional Expenditure Review Report.

was launched in 2011 as a mechanism for advocating for the agricultural sector with a common voice.

- b) The piloting of an Agricultural Innovation Grants Scheme (AIGS) has been catalytic in the operationalisation of this new results-driven way of working and has demonstrated that such an approach can act as an effective mechanism for delivering services to smallholder farmers.

A recent independent AusAID sponsored sector review (Gilbert and Hall, 2012) and Independent Completion Report (Hall and Gilbert, 2012) looked at the questions of achievement and sustainability. Both these reports support ARDSF's own view of its achievements and suggest that ARDSF leaves behind a more coherent NARS with a more credible role in the development process. This review highlighted significant capacity building achievements in three major areas:

1. Capacity to identify and support smallholder-responsive production and livelihood opportunities: The Agricultural Innovation Grants Scheme.
2. Capacity in smallholder-responsive organisational planning and implementation at the organisational and NARS levels.
3. Capacity in smallholder-responsive policy processes.

These capacities are evidenced by the following

- The development by the NARS organisations of new strategic plans with accompanying revised organisational structures and results frameworks that lay out realistic operational means of using research to address developmental ambitions in the smallholder agricultural sector.
- The institutionalisation of learning and results-oriented M&E systems that allow the NARS to continuously adapt and upgrade the way they work.
- The development of new and productive patterns of partnerships between the NARS organisations and other sector stakeholders. The scope and diversity of partnership expanded in projects funded under the AIGS. More importantly the leadership by non-traditional partners of some projects indicates that the NARS organisations are

readjusting their role within innovation systems to account for the way they now perceive their contribution to the development process.

- The AIGS made four calls for proposals and funded 33 projects. A number of value addition projects from this have significantly increased farm incomes. The focus on value addition helped target women, as food processing is traditionally their domain. It is estimated that even in its pilot form, this funding mechanism is providing new production and livelihood opportunities for many rural households.
- The establishment of a NARS policy forum has created a space for agricultural research and extension organisations to engage in the policy process and promote the enabling conditions needed for innovation. This is part of a wider process in which the NARS organisations have become effective and legitimate champions of a new smallholder-centric development paradigm.
- The inaugural NARS policy forum endorsed the policy option of establishing a national competitive agricultural innovation grants scheme (NCAIGS) to support novel ways of improving smallholder agriculture production and livelihoods. This built on the experience of the AIGS. It is anticipated that this will provide a new and effective way of funding agricultural innovation. It is also anticipated that it will form a way of pooling funds from different sources and channeling these not only to research organisations but also the private sector, non-governmental organisations and community-based organisations.
- The NARS policy forum and the proposed NCAIGS will form elements of a new policy instrument to support smallholder innovation and development — the National Agricultural Innovation Facility (NAIF).
- With realistic results-driven strategic plans in place, research organisations have been able to attract new funding from public and private investors interested in seeing impact on the ground. The mining sector has been a notable private investor. NARI has not only seen its external funding substantially increase, but it has also been able to be selective, only accepting funding that will contribute to the goals set out in its strategic plan. This has helped avoid the dilution of mandate by donor-led projects.

BOX 12.1. SUMMARY OF ARDSF IMPACTS

ARDSF has achieved impacts at four levels:

1. *Policy.* The processes and arrangements that govern and shape sector support, including agricultural research and allied services
2. *Organisational.* The way organisations plan and structure their work
3. *Institutional.* The practices and routines that shape the way individuals and organisations work collectively and individually
4. *Household.* Changes in agricultural productivity and livelihoods

1. Policy. ARDSF established a mechanism to increase the role of research and research organisations in the policy-making process. This involved the creation of a NARS policy forum. A key policy change emerging from this was the adoption of the AIGS as a model for a GoPNG national competitive grant scheme under a proposed National Agricultural Innovation Facility.

2. Organisational. ARDSF has helped the NARS organisations develop impact-oriented strategic plans with accompanying revised organisational structures as a result of establishing organisational and management systems and results frameworks that lay out realistic, operational means of using research to address developmental ambitions in the smallholder agricultural sector.

3. Institutional. ARDSF has helped the NARS organisations adopt a number of behavioural changes. Some of these have been associated with their exposure to AR4D as a way of framing capacity development. This has meant that NARS researchers now routinely explore the links between their research and development outcomes and are working in new ways to achieve this. This is evidenced by their involvement in AIGS-supported projects, where expected results are developmental and the implementation process is collaborative. The strategic management and development of human talent elements of AIGS has also brought about behavioural changes with regard to gender and HIV/AIDS. This is evidenced by the consideration of these issues in strategic planning processes, results frameworks and monitoring systems.

4. Household. Detailed impact assessment at the farm and household levels has not been conducted as part of this review. However, qualitative information on a number of the AIGS projects suggests that these have high potential for impact. However, it needs to be recognised that farm-level impacts will be of a modest scale as the AIGS was a pilot initiative with 32 projects and its aim was to develop the approach as proof of principle rather than as a full-scale delivery mechanism.

In summary, the major impacts of ARDSF have been at the policy, organisational and institutional level. If sustained these capacity impacts have the potential to bring about large farm-level impacts in the future.

Source: Hall and Gilbert (2012)

The Gilbert and Hall (2012) review also acknowledges that ARDSF's achievements have not been uncontested. It notes that stakeholders' views about the value of ARDSF and its achievements were highly polarised, with some strongly supportive of ARDSF and some highly critical. It concedes that:

“Interviews with the NARS organisations and their partners reveal enthusiastic support for the process of capacity building that ARDSF facilitated. The AR4D approach adopted by ARDSF and the cascading logic used in the strategic planning process were also broadly appreciated. Other sector stakeholders, however, felt that AR4D had become an inflexible mantra rather than a practical tool for improving performance management and capacity building.”

The same review concluded that the headline outcomes of ARDSF “represent a significant achievement that should be celebrated as a success and that, in addition, hold key lessons for PNG stakeholders and agricultural development practice more generally”.

Box 12.1 contains a summary of the types of impact achieved by ARDSF identified by its reviewers.

IMPACTS FROM THE AIGS

In the final months of ARDSF the facility commissioned an impact assessment study of the 12 Call 1 projects funded through the AIGS. The study was conducted by an external consultant. As discussed in chapter 9, four calls for proposals were issued through the AIGS. Considerable iteration took place during this cycle of calls. The first call was relatively conventional, being couched in terms of promotion of research findings, with no specific theme being identified to help develop strategic focus for the projects supported. Subsequent calls became more focused on specific strategic themes.

Also, subsequent calls were much more clearly targeted at innovations that provided opportunities for smallholders rather than being necessarily supplied from research finding. The Call 1 projects were, therefore, probably the weakest of the AIGS- supported projects. Despite this, the impact assessment provided some evidence of the value of the AIGS model (ARDSF, 2012a).

Headlines from this study include:

- The extent to which an individual project had effectively achieved its intended outcomes was assessed as moderate to substantial. A majority of projects (eight out of the 12) are assessed as making moderate progress against objectively verifiable indicators (OVIs) at Purpose level. Four projects made substantial progress and four projects moderate progress. Three projects made little progress. Scores are expected to rise as all projects complete.
- Six projects provide evidence of significant developing, attributable, socioeconomic and livelihood impacts. Project achievement for specified impact (goal) range from possible to moderate, with some as average. The relatively low scores are attributable to the time lag after project completion before Impacts are identifiable, compounded by the delayed completion of projects. A second influence is project goals being set at too high a level, which in turn, tends to make projects overambitious, inflates their planned Outcomes and leads to under-performance.
- In terms of Outcomes from mainstreaming (gender), the large majority (10) of Call 1 projects will or seem highly likely to have contributed to improved gender equality and positive 'gender Outcomes'. This is a creditable result, the positive achievement reflecting in large part the sincerity of the project managers and their partners, stimulated by the project formulation guidance given by AIGS.
- The Call 1 portfolio seems highly likely to have delivered some potential or actual positive outcomes for the HIV/AIDS-affected, through participation in the innovation technology, through awareness training, or through establishing the networks for improved future outcomes.
- An important feature of AIGS's potential livelihood outcomes and impacts is that they are not derived from innovation by the NARS as the ARDSF Goal anticipates. Rather, some, including the more creative innovations in the Call 1 portfolio, are attributable to projects led by non-NARS organisations and into which the NARS have made limited or no direct contribution.

The impact assessment study also raised a number of cautionary points that relate to the challenges of introducing a learning perspective in projects and into AIGS as a whole. The last point is particularly important as it concerns

the way experiences such as these can be leveraged in policy decisions about the expansion and use of such approaches. The study articulates these points as follows:

- For Call 1 projects, formalising the lessons learnt and knowledge sharing from the lessons and experience has been less than Call 1 implementation merits and less than might be expected from a pilot agricultural innovation competitive grant scheme (CGS). The different project reports seen by the impact assessment study neither do justice to the AIGS formats, nor to the work and learning that was happening, nor to developing the capacity of the project staff to document, analyse and report outcomes or issues and build on learning. Had more guidance and feedback been available to project staff (as indicated it would be in the Call 1 guidelines), the AIGS would have been better placed to facilitate pertinent learning among its partners, stakeholders and those CGS or AR4D practitioners who may follow.
- Assessment of the efficiency and effectiveness of a competitive grants scheme is a specialist task and providing this to the standard that would be needed for donors and the national stakeholders' decision-making — for example, on the AIGS's transition to national capability — is a specialist task. The impact assessment is not aware of plans for an independent evaluation of AIGS as a CGS that would provide this assessment and inform this stakeholder, and other, dimensions.

CAN THE ACHIEVEMENTS OF ARDSF BE SUSTAINED?

Has ARDSF really brought about a paradigm shift? In fairness it is probably a little early to make such a bold claim. It is, nevertheless, apparent that a significant change in capacity has been achieved. It has to be recognised that capacity building of this sort is never going to be a “job completed”. Rather it is a question of whether the process of learning-based change and institutional and policy development has reached a sufficient level to sustain itself.

The evidence presented in the chapters in section 3 of this book attest to the strong support and ownership of the ARDSF process within the NARS. However, it also needs to be acknowledged that capacities, plans and frameworks put in place have not yet had the opportunity to deliver

widespread changes in service delivery to smallholders. After all, the main service delivery innovation of ARDSF, the AIGS, was only a pilot scheme funding 33 projects.

Towards the end of ARDSF one NARS organisation commented that “we are not yet able to harvest the benefits of ARDSF” — a quote that reflects the wider sentiment of stakeholders that the ARDSF capacity building process was still at an early stage of maturity. The ICR report (Hall and Gilbert, 2012) mentions that some stakeholders felt plans and new capacities were now in place, but that there were no resources to operationalise these plans. Others felt that there is still a need for widening the capacity building process to include, for example, other agricultural science organisations (UNITECH university, fisheries and forestry research institutes), provincial and district level service providers and even the Department of Agriculture and Livestock (DAL).

The reality of ARSDF was that the completion of AusAID funding of this program in mid 2012 came at a critical stage in the policy development process, particularly with respect to the adoption of AIGS as a national scheme under the proposed NAIF. There is no doubt that there is now strong ownership and a more coherent voice and sector leadership from the NARS — and this can largely be attributed to the support provided by ARDSF. This is reinforced by proactive support from the Ministry of Agriculture and a recent change in leadership at DAL. But this new dynamic was still nascent and fragile at the time of writing this book and may yet prove insufficient to persuade the GoPNG to place significant resources in the proposed national competitive grants scheme.

It is also important to understand why AusAID support to ARDSF ended at this point. Initially ARDSF had been envisaged as a 10-year intervention. However, three years into ARDSF AusAID and the government of PNG reviewed aid priorities in the country. At the time the Government of PNG did not identify agriculture as a priority sector. In part this was because the PNG NARS had not yet developed a coherent voice and credible track record to make the case with the government that the sector was important and that there were realistic opportunities for using it as an engine of development in the country. AusAID responded to the priorities identified by the PNG government and focused its attention on health, law and justice and moved away from the agricultural sector. These are certainly valid priorities. However, this development underlines the fact that the sustainability of a capacity building

process is largely dependent on political and policy recognition and support. In the case of ARDSF this came too late to allow continued investment by AusAID.

This timing was unfortunate. The completion of ARDSF occurred at a point when counterpart donor support of the national grants scheme, and, therefore, of the wider framework within which it sits, could prove pivotal in securing budget support from the GoPNG. Probably more important than lack of counterpart donor funding is that AusAID's ending of support added to negative perceptions of the performance of agricultural agencies at a time when they most needed others to demonstrate confidence in their capacities and thus attract policy and investment support in PNG.

At the end of ARDSF stakeholders in the NARS were pragmatic in their view about the reality that AusAID was not continuing support for the ARDSF process. They articulated a determination to find alternative options to resource the new approach of conducting research for development (pers. com. Eric Omuru). The NARS, however, have some ways to go in persuading a range of influential stakeholders and commentators that they have made significant advances in terms of their ability to meaningfully contribute to smallholder agricultural development. At the time of writing, it is now very much up to the NARS organisations to take up the challenge of proving and communicating that their performance has improved as a result of ARDSF. Similarly the NARS must prove that they can act as a coherent voice in sector policy debates as this may be critical in demands for improvements in the enabling conditions for sector development — for example, investments in transport infrastructure.

In conclusion, this outlook for the sustainability of ARDSF's achievements looks rather fragile. But it does underline the critical importance of engaging with policy as part of the capacity building process. ARDSF recognised this explicitly. It made strenuous efforts to engage policy-makers and made good progress in securing a successor national grants and support facility that could continue the capacity building process that ARDSF had helped put in place. Nevertheless, the completion of AusAID support before ARDSF's key achievements have been fully adopted and institutionalised by the GoPNG increased uncertainty and weakened sustainability. At the time of writing this book it is not clear how this process of institutional change will proceed or who, other than the NARS, will champion this process in the absence of ARDSF/ AusAID support.

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Lessons from ARDSF and Reflections on AR4D

Andy Hall¹ and Adiel N. Mbabu²

The aim of this chapter is to draw lessons from the experience of ARDSF and to make more general reflections on AR4D — an approach that became central to the implementation of ARDSF and its capacity building support to the agricultural research and extension organisations of PNG. The chapter begins by distilling the main lessons from the ARDSF experience documented in the previous chapters.

As discussed in chapter 12, ARDSF achieved some significant advances in terms of building capacity. There were some questions about the sustainability of the capacities developed and these will be discussed in more depth later in this chapter. Nevertheless, ARDSF did deliver much of what it set out to achieve. We start by presenting a summary of what we believe are the key features and lessons learnt from its design and implementation.

LESSONS FROM ARDSF

Pragmatic outcome orientation. The scope of ARDSF was very broadly

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defined, with a simple and highly pragmatic aim: help PNG's agricultural research and extension organisations better deliver technical support and services that would generate developmental outcomes at the farm level. This broad scope and pragmatic aim helped maintain a focus on the outcomes to be achieved while leaving the implementation path open to interpretation and the capacity building needs that emerged along the way. It also provided a simple narrative that all stakeholders in the agricultural sector could relate to. In other words ARDSF was about achieving development outcomes rather than just better research and this had broad appeal and relevance.

A support facility rather than a program. Designed as a support facility, ARDSF did not predetermine what sort of capacity building support was required in Papua New Guinea other than to have two broad themes of organisational development and a grants scheme. This allowed room to develop a capacity building approach suited to the circumstances, needs and challenges prevailing in PNG. This meant support could be demand-led and iterative. It also provided the flexibility to be able to respond to the changing agricultural development environment; for example, it allowed ARDSF to pursue linkages with policymakers when a window of opportunity opened to allow this.

Combined advisory and operational support. The design had an embedded AusAID agricultural research and development advisor with expertise in impact-oriented capacity building rather than in service delivery, per se. This allowed ARDSF to engage research and development organisations in discussions about capacity needs for impact rather than relying on introducing a particular service delivery model. The advisor was then able to link PNG organisations to a wide range of new and appropriate perspectives and expertise to service their capacity building needs.

Combined organisational development with a grants scheme to fund new ways of working. The design included an agricultural innovation grants scheme, discussed in detail in chapter 9. This had a number of functions: supporting innovations that would provide production and livelihood opportunities for smallholders; supporting service delivery innovations that would help develop those opportunities; and developing institutional arrangements for a competitive innovation funding mechanism that could be transformed into a national funding scheme. The grants scheme, in fact, became catalytic in stimulating institutional, organisational and policy changes.

Designed as a policy experiment. The design was explicitly experimental with space to develop new ways of working that would help improve the delivery of services. The grants scheme mentioned above is the most obvious example of this as it was viewed as a pilot for a national scheme, but other aspects of the design meant that it had an explicit agenda of using ARDSF experience to influence policy.

A learning and performance management system. ARDSF spent considerable time developing a learning-oriented performance management system. This was based around a cascading logic, discussed in chapters 2 and 10. The plan for this system was comprehensive, focused on tracking institutional change and development outcomes. However, its implementation was delayed and it proved cumbersome to use. It would appear that developing effective, user-friendly systems of this sort remains an outstanding challenge for such programs.

A systemic approach. Over and above its design, the success of ARDSF hinged on the way it tackled, in an integrated way, all the dimensions of what is now understood to constitute capacity. It did not cherry pick its way through the process by supporting only specific aspects, but instead tackled capacity building in a holistic way. It helped organisations develop plans, priorities and strategies in a way that had explicit links with other organisations and activities involved in the development process. It tackled this both in terms of organisational “hardware” (plans and program structures, etc.), as well as in terms of the mindset of stakeholders involved in the new approach, equipping them to think, plan and work in a new way. It also tackled both organisational and policy dimensions of capacity. The fact that the sustainability of ARDSF’s achievements still rests on continued policy support only goes to underline how critical an aspect of capacity building this dimension is. It could be genuinely said that the ARDSF approach had a scope that tackled both paradigm and practice and helped organisations develop the tools and skills to translate the former into the latter. AR4D was critical in helping ARDSF frame this systemic approach as it proved a theory of change that was explicitly systems-oriented.

A robust and well-communicated capacity building framework. The adoption of AR4D as a way of framing ARDSF’s capacity building support was critical in providing a common point of reference for all support activities. It provided a vision for the whole program of support and ensured that all activities were logically connected and contributed to the overarching capacity

building objective — in the case of ARDSF this was the improved delivery of service to smallholder farmers. In practice this meant that ARDSF had to spend considerable time communicating its framework to stakeholders and building their understanding of its principles and the practical implications of these. While this meant that foundational activities were prolonged in ARDSF, it paid dividends later in terms of ownership of these ideas and the momentum this gave the process of change.

Champions of the capacity building process. Once the NARS organisations recognised the power of AR4D thinking, they were able to champion the wider negotiations around the development paradigm that were necessary to make research a viable contributor to national development goals. Governance mechanisms, which involved a range of public and private stakeholders from the agricultural sector, also became an essential part of the championing process as they tended to provide guardianship of the concepts and approaches being pursued. For example, the chairman of the ASSC (AIGS Scoping and Selection Committee) had previously worked as an advisor for the process of formulating PNG's national development plans and, in the course of doing so, noticed that the NARS' new approach had something critical to offer. He championed the approach and once he assumed the chair of the ASSC he was able to drive the grant scheme in a more development-focused direction against stiff opposition from some stakeholders.

Facilitated workshops that dealt with hard and soft skills development and organisational and individual level competencies. The organisational development component of ARDSF involved a series of facilitated workshops with the NARS organisations that tackled various aspects of the process of creating results-driven learning organisations. The workshops were organised as different modules and tackled both the “software” of capacity: attitudes, organisational culture, communication and partnering skills, self-perception, and leadership; as well as the “orgware” of capacity: strategic plans, results frameworks, M&E systems, human resource policies and work plans. Capacity development modules were aimed at all levels in the organisation, not just research managers and directors. A key part of this support was an emphasis on the development of human talents: equipping people with the skills needed to work in a learning-based organisation. The logic behind this was that the cultural changes needed to adopt an AR4D orientation had to be rooted in people, not just organisational plans. This coupling of organisational and individual level competency building was critical in the achievements of ARDSF.

Included a mechanism for addressing policy change in the enabling environment. Although building capacity of the policy process was not an explicit component of ARDSF, policy engagement was implicit across the whole of its design. The theory of change implied by an AR4D orientation meant that addressing policy change was highlighted as part of the capacity building agenda, as policy provides the enabling environment for agricultural innovation and development. ARDSF exploited a political window of opportunity in Papua New Guinea to negotiate the establishment of a policy forum that brought together agricultural researchers and policymakers to share information and plans on sector development and support. This was critical in developing proposals in the PNG government for a successor support intervention.

Building the capacity of research organisations in strategic planning and results-based management allowed them to take advantage of windows of policy opportunity. Political convergence played a critical role in supporting this new mode of capacity building. The efforts of the PNG NARS organisations to transform themselves into an effective mechanism for addressing agricultural development and rural poverty coincided with and contributed to the government of PNG crafting a new national development plan — the PNG Vision 2050 exercise. This placed smallholder agricultural development centre stage in efforts to achieve national prosperity. Since the new strategies of the NARS organisations presented a way of operationalising this new vision, key policymakers in the country lent critical support to important capacity strengthening initiatives such as the institutionalisation of the NARS policy forum and the National Agricultural Competitive Grant Scheme.

Balance of farm-level outcomes with institutional development outcomes. The ARDSF experience suggests that a balance (and timing) needs to be achieved between demonstrating farm-level outcomes and facilitating the institutional, organisational and policy changes to create the capacity to deliver these outcomes. For example, an innovation grants scheme is a powerful mechanism for blending research with development activities that together create meaningful opportunities for smallholders. This ability to show farm-level results also has powerful demonstrational effects in persuading stakeholders (policy, donors and research and development organisations) that a new approach has the ability to deliver. An implication is that the organisational development activities pursued by a program such as ARDSF might be able to move ahead more quickly if they are “piggybacked”

on a grant scheme rather than the other way around. It could be argued that the reorientation of the NARS is a prerequisite for establishing a new funding mechanism. However, there is no reason why these two processes of resourcing and organisational development (including creating coherent organisational and national development plans) cannot proceed in parallel and iterative ways.

Better communication of results to attract policy support. A related issue concerns the need to better communicate tangible farm-level results from development programs of this type. Generating policy support for agricultural agencies and the new approaches and capacities put in place by ARDSF-like projects is highly dependent on the effective communication of changes in performance. This is particularly so given the generally negative policy perception of the performance of agricultural agencies and their limited relevance to general development progress. Effective communication is also a critical part of negotiating the implementation of a new approach with multiple stakeholders. Communicating results also requires timely and robust monitoring, evaluation and learning arrangements to generate such results. The experience of ARDSF suggests that there is still much more work required to perfect effective arrangements to generate information to underpin learning and policy support.

Longer time frames for capacity building interventions. ARDSF's aim of improving service delivery by selected NARS organisations to smallholder farmers in Papua New Guinea was very ambitious for a 5-year project. Leaving aside the fact that the program got off to a slow start, the experience of ARDSF reveals that capacity development to improve farm-level outcomes goes beyond simply upgrading specific activities of research organisations. Rather, it involves significant institutional changes (new ways of working, organisational cultures, etc.), organisational changes (new structures and planning, monitoring and evaluation systems), changes in resourcing mechanisms (grant scheme arrangements) and changes in the wider policy environment. Not only are these changes wide-ranging in their scope, but given the number and diversity of stakeholders involved (in the ARDSF experience), these also require a protracted process of negotiation and assimilation. As discussed in chapter 12 there also remains an open question as to whether the laudable progress in capacity building by ARDSF can be sustained without further external support. This suggests national and international investors need to be willing to give a longer time commitment to such capacity building programs.

The value of grants schemes in promoting innovation for the poor. The experience of the Agricultural Innovation Grant Scheme (AIGS) in ARDSF suggests that this is an effective mechanism for promoting innovation that provides opportunities for poor people. This model is applicable more widely than in the agriculture sector alone. The experience of ARDSF suggests that key features of such a scheme include: a clear articulation of what innovation and innovation projects entail (critically, that this concerns anything new that creates opportunities for poor people); rigorous scoping of grant-making calls guided by an overarching strategy linked to wider development priorities and outcomes; calls open to proposals from all types of organisations; program assistance to grantees to develop proposals and link up with new partners, particularly when project leaders are from the development sector; and governance arrangements to help ensure targeting of women and poor households.

Capacity building as negotiation. There was a need for constant negotiation during the entire capacity building process in the ARDSF experience. Partially, this involved negotiation within the NARS organisations about the nature of their role in the development process. It also involved negotiation within ARDSF and between ARDSF and the NARS about what sorts of capacities needed to be strengthened and how this process of strengthening should proceed. It involved negotiation between the NARS organisations and policymakers about the nature of mechanisms needed to link agricultural research and extension to policy and about how this mechanism should be institutionalised within the policy process. It also involved negotiation about the scope of a grant scheme, its mechanism of governance and procedures for how its performance should be tracked. Last, but not least, it involved negotiation with the donor on what sorts of outcomes ARDSF was expected to deliver.

Tolerating risk. ARDSF was a highly risky innovation in service delivery support using a largely untested approach that took some time to demonstrate results. AIGS was also risky in the sense that it was funding unfamiliar partners and activities in an institutional setting where due diligence screening was challenging and accountability track records of partner organisations were largely unknown. A general lesson here is that national and international investors, in supporting agricultural innovation, must continue to demonstrate the same healthy appetite for risk — while maintaining appropriate and proportionate controls — that they expect from those they wish to enable to innovate in the agricultural sector.

REFLECTIONS ON AR4D

Contributions to knowledge gaps

As explained in chapter 2, the state-of-the-art on AR4D and organisational development approaches for agricultural research provides a strong set of principles for a new direction in capacity building. This suggests that: It needs to be learning-based and participatory; it needs to be results-driven and explicitly link research to development; it needs to take a systems view, whereby research is planned and executed as part of wider development agenda and involves partnerships with policy and practice stakeholders; and it needs to be a conscientious process, whereby capacity building responds to the evolving context of the agricultural sector. However, these principles leave three major unanswered questions for practice and interventions seeking to building capacity, which, hopefully, the ARDSF experience can throw some light on.

1. What type of support program can enable this type of learning-based systemic capacity building of the sort suggested by AR4D?
2. Can such a program promote the attitudinal change needed to create an enabling environment for AR4D?
3. Will such a program be sufficient to ensure the sustainability of the capacity building process put in place and the emergence of AR4D as a routine way of supporting agricultural innovation and development?

What type of support program can enable this type of learning-based systemic capacity building of the sort suggested by AR4D?

The features and lessons from the ARDSF experience presented above go some way to answer the first of these three questions. However, ARDSF is not a blueprint for the sort of capacity building support needed to nurture an AR4D outlook and way of working. If one were to distil its lessons down further, two things stand out. The first is the magnitude of the effort required to change attitudes and the common understanding of the way research relates to development (see further discussion below). Of equal magnitude is the effort and time needed to rethink and put in place new plans and arrangements to make this new way of doing research for development a reality. The aspect of shifting to a learning organisation orientation seems particularly challenging, not to speak of the challenge of developing working learning-oriented M&E

systems. This was probably the weakest part of ARDSF, not because it wasn't well thought out, but because it takes a long time to get these systems up and running, capabilities to operate such systems are often weak and because M&E seems to be an area where attitudes are difficult to change. It is also an area that few researchers and practitioners get excited about.

The second thing that stands out from ARDSF is the value of the agricultural innovation grants scheme. Again, it is important to stress that an innovation grants scheme does not equal an AR4D orientation or approach. However, a grant scheme seems to be a hugely powerful way of introducing a development outcome orientation and providing opportunities and incentives for researchers and others to work in an entirely different way. ARDSF also tells us that getting the strategic focus, governance and implementation of these schemes right takes time and trial and error. However, once up and running these schemes can be catalytic in bringing about change, both at the organisational level and the policy level and, of course, in terms of delivery opportunities to poor people.

Can such a program promote the attitudinal change needed to create an enabling environment for AR4D?

Attitudinal change can be hard to assess. One way of thinking about this is to look at the extent to which the common narrative of how research leads to development changes. Looking at it this way it can be seen that ARDSF set itself a considerable challenge. By design and by the implementation path chosen, ARDSF was advocating a theory of change that suggested that the only way to build capacity for improved service delivery and impact on farmers was to address this in an integrated way at all levels of the development process: activities, organisations and policies. This implied a major reorientation of the development process towards innovation (of all sorts) that supports smallholder farmers. But agricultural research and development in PNG was, at that time, understood in an entirely different and more techno-centric, conventional way.

For example, the NARS organisations, while all having smallholder impact goals, still operated in a very traditional research-led way with few links to the wider development process. Similarly, national development goals also focused on poverty reduction, but, in reality, sector development plans still largely equated agricultural development with improving the performance

of the plantation sector. Transferring technologies from research to farmers was the dominant way most key stakeholders viewed innovation. This view was quite pervasive and had been reinforced by the way external donors had supported capacity building and research earlier. These views persisted in some quarters. For example, early progress reviews of ARDSF could not appreciate why the dissemination of research finding to farmers was not its main focus.

Perhaps, more challenging still, ARDSF inherited staff and procedures from predecessor support projects that had relied on these techno-centric views of innovation.

What this meant in practice was that the first two years of ARDSF were taken up with equipping key stakeholders with a vision of what innovation for impact actually meant. Only then could capacity development efforts really start to make progress. These stakeholders spanned development, research and extension organisations, policymakers and donors. Only if they all subscribed to the new theory of change could new capacities be built. The time needed for this negotiation process created other problems — for example, there was pressure from the donor to spend money on activities before appropriate institutional arrangements had been developed.

This negotiation of the theory of change continued throughout the life of ARDSF and it gradually developed a community of researchers who subscribed to this vision. A participant at one of the final human talents workshops summed up the NARS organisations' enthusiasm for AR4D and the changes that occurred: "The old school way of thinking had us locked in cages, unable to help the people who needed us most. Now we have the freedom to make a difference."

Of course, the attitudinal changes of the magnitude and scope AR4D implies cannot be achieved universally by a time-bound intervention such as ARDSF. In PNG there were research organisations not involved in ARDSF who were at best skeptical about the theory of change implied by AR4D and the new ways of working it demanded. Policymakers and bureaucrats certainly moved a long way in their thinking of how agricultural research should be supported and about its role in development. However, it is fair to say that the process of negotiating this new theory of change to the point where it becomes the unquestioned common policy narrative will need to continue for some time to come in PNG.

One of the challenges that advocates of the new way of doing business face is that they are yet to come up with convincing, hard evidence that the new ways of working that they have developed can deliver the sorts of development impacts that are promised. There are good reasons why this evidence is not available, mainly due to time lags between capacity building and impacts. However, advocates of AR4D will need to explain to skeptics the timeframes when impact can be expected, how evidence will be collected and evaluated and what this evidence will look like. Such information would be a powerful tool in widening the attitudinal changes needed to support AR4D in PNG.

Will such a program be sufficient to ensure the sustainability of the capacity building process put in place and the emergence of AR4D as a routine way of supporting agricultural innovation and development?

The sustainability of AR4D perspectives and capacities introduced by a program such as ARDSF need to be considered at two levels. The first concerns the capabilities of individuals and organisations to continue working in this new way. In the case of the NARS in PNG it is difficult to comment on this with some certainty. The strategic and organisational plans and M&E systems developed by the NARS during the life of ARDSF should go a long way in institutionalising the approach. As discussed before, these organisations do genuinely seem to have gone through the attitudinal changes needed to sustain such an approach. However, as chapter 12 explains, the real challenge to the sustainability of AR4D perspectives in PNG is the policy enabling environment.

The reason that ARDSF ended up as an “unfinished symphony” was that policy support was missing at a critical point in the discussion of sector priorities and support. The necessary political support for policy measures to sustain the capacity building and facilitation started by ARDSF did materialise towards the end of its life.

However, only time will tell if this proves sufficient to establish a national agricultural innovation support facility and associated grant scheme. What this does indicate is that not only is policy change a critical part of the capacity building process and the shift to an AR4D orientation, but also that it is never too early to start engaging with policy and decision-makers on the need to think of the relationship between agricultural research and development in different ways.

Another dimension to this concerns the ability of agricultural research organisations to come up with a credible narrative of how their new ways of working actually improves service delivery to farms and improves productivity, profitability, sustainability and livelihoods. The sustainability of programs to build AR4D capacity might yet be dependent on their ability to back up advocacy with evidence of improved performance. This was probably one of the weaker aspects of ARDSF, although the facility did commission an impact assessment of AIGS in its last months.

REVISITING THE QUESTION: WHAT IS AR4D?

The literature reviewed in chapter 2 on the emergence of AR4D leaves its precise operational definition unstated, or at least not universally agreed upon. Some scholars hint at the range of planning and management systems that will need to be adapted (Horton, 2012). Hawkins et al. (2009) go as far as to apologise for including such a wide breadth of concepts under the AR4D umbrella. This is something that we have struggled with also in this book. We have found ourselves using the term ambiguously: chapter 2 discusses an AR4D system; at other times we refer to it as a perspective or orientation, while elsewhere we discuss it as a theory of change for negotiating the rethinking of practices and approaches. The international organisations using the AR4D term also seem to have left its precise definition quite fluid.

In our own professional lives as agricultural innovation specialists we see interventions that don't call themselves AR4D, but clearly are. At other times we see interventions that explicitly label themselves as AR4D, but clearly aren't. This tends to suggest that there are some characteristic features that we recognise. However, these features are not a specific set of tools. For example, the use of the idea of an innovation platform (a way of organising the interaction of different stakeholders in the innovation process) may indeed help the use of agricultural research for development, but an innovation platform doesn't equal AR4D. The same argument could be made about the innovation grants scheme in ARDSF. It was a valuable tool in linking research into the development process in PNG, but on its own it was not AR4D.

Our view is that AR4D, at its simplest, is a way of doing research that makes its contribution to specific development objectives explicit and that is undertaken as part of an explicit plan that sets out the steps that are necessary (and realistic) to achieve that objective.

What this means in practice is not necessarily the slavish adherence to tools such as public-private sector partnerships, innovation platforms, policy forums, farmer participation or competitive innovation funds — although all these are powerful tools in the right circumstances. Instead, it means clearly identifying the development objectives that are being targeted and then being pragmatic about the tools and approaches that are needed to ensure that each objective is being addressed. A systems understanding of innovation and change, which now has quite a well-established history of principles and practices (World Bank, 2012), contains a rich repertoire of tools and approaches that can be brought to bear in a program. AR4D draws heavily from these systems perspectives. Its greatest contribution is that it presents a plausible theory of change that allows practitioners and planners to rethink the way they work to achieve objectives and to select tools from this repertoire that will help them move forward.

The literature on AR4D — and indeed the documentation on ARDSF — places great emphasis on learning by doing, reflection and organisational learning. This is probably the most characteristic feature of an AR4D style of working and, indeed, of systems perspectives in general. If there was any single tool that could be thought of as synonymous with an AR4D style of working, an effective learning system would be it. Such a learning system would include: an effective performance management or M&E system; facilitated strategic and organisational planning of the type seen in ARDSF; a research culture that supports an institutional learning and change agenda; operations research that explores processes and pathways to impact; and links to a community of practice sharing experiences and lessons. Yet such a learning system is probably the most difficult part to get right (ARDSF included) and in our experience the most rarely encountered. Without it the systems ethos of coping with uncertainty and learning ways of working in changing circumstances (or in unknown problem areas) simply falls apart. Organisations and policy regimes slip into the rut of routines that never question the effectiveness of approaches and policy tools. Only a style of doing research that continuously questions, revisits and adapts the way it works — and the theory of change that it uses as a guide — can be thought of as AR4D.

PROMOTING AR4D: WHERE DO WE GO FROM HERE?

How can international development investors help? One thing that does emerge from the ARDSF experience is the transformative power of a new

framework as a way of rethinking development practice. This is particularly so when these frameworks are used to redefine theories of change and translate these into new capacities and strategies. This is a message that goes beyond agriculture. In a sense the basic premise of AR4D — of making links between sector investments and development outcomes — applies equally to health or education or infrastructure. Our message here is not that AR4D (or rather XR4D) should be applied more widely beyond agriculture, although there is no reason not to do that. Rather our message is about the important role of donors and investors in supporting the development, refinement and testing of such frameworks and systematically learning about their effectiveness.

A second role for development investors is in supporting the emergence of communities of practice around new development frameworks. Our review of AR4D thinking in chapter 2 of this book reveals a series of different interpretations of this idea that would probably benefit from sharing experiences with others. This would help challenge some of the rhetoric about what AR4D can achieve and it would support the continued refinement of the application of these ideas.

For the advocates of AR4D (and we include ourselves in this category) there is a critical question that cannot be avoided. Does it work? Does it deliver the development impact we are promising? Or are we simply deluding ourselves with conceptually elegant explanations of how innovation could and should work. This is a particularly important question for AR4D because it requires an enabling environment to flourish and this, in turn, requires attitudinal change from practice to the policy levels. As persuasive as our conceptual models might be, for AR4D to really move into the mainstream, we need to be able to shift from advocacy to evidence. And this is likely to mean evidence of increased agricultural productivity, incomes and food and livelihood security. We can describe enhanced innovation capacities quantitatively, but making the link to outcomes is much more problematic. There are good reasons for this. Benefits from institutional change and capacity building take time to translate into development outcomes. Also, there are methodological challenges in associating capacity changes with specific measures of developmental change. However, these challenges cannot be dodged forever. Advocates of AR4D need to be clear about the time frames necessary to see these outcomes, the methods that will be used to assess them and the format in which evidence will be delivered. Developing and applying these methods is a critical element of the learning systems required to usher in the emergence of more impactful agricultural research practice.

Finally, for those readers who are starting their own journey on the road to agricultural research for development we hope that the experiences of ARDSF and the many highly committed players in the PNG story inspire you. It's a long, hard and painful road to travel, but the destination is well worth it.

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Capacity Building for Agricultural Research for Development

Agricultural research for development (AR4D) is an emerging mode of agricultural research practice in the international development community. Definitions of this practice are still rather fluid, but its key intent is to directly link investments in research with tangible development outcomes. The way to actually do this is still a work in progress. However, AR4D's use of systems perspectives on learning, innovation and change have fundamental implications for the way agricultural research is conducted and the way capacity is built.

This book contains a collection of papers that discuss the experience of an AR4D capacity building program in Papua New Guinea (PNG). The program was the AusAID-funded Agricultural Research and Development Support Facility (ARDSF), which ran for 5 years from 2007 to 2012, and which sought to improve the delivery of services by agricultural research organisations to smallholder farmers.

The papers in the book combine process documentation of ARDSF's AR4D capacity building process with critical analysis of these experiences. The book also explains the general principles of how AR4D reframes capacity building efforts. Its aim is to provide a resource and inspiration for the global community of researchers, planners and investors who wish to make agricultural research a more effective tool in development efforts.

In its conclusion the book draws attention to the critical importance of institutional and policy changes needed to sustain this new way of conducting agricultural research. It also highlights the remaining challenges of designing effective learning systems needed to support continuous innovation in the way agricultural research is deployed for development purposes.



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